STEEL

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for Safety

The safety and serviceability of power stations and high pressure pipe lines depend almost totally on the safety and dependability of piping and tubing. Because of its walls of homogeneously strong, tough steel—without welds or weak spots—Pittsburgh Seamless has the essential soundness and strength upon which safety and service depend.

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As the Editor Views the News

ACTION of a subsidiary of U. S. Steel in setting up an agency for selling pig iron virtually completes an important chapter in the evolution of the American merchant pig iron business. Forty years ago practically every rolling mill bought its pig iron from operators of merchant blast furnaces. Twenty years later, in the move toward integration, many mill interests acquired their own stacks, although much iron still was purchased from merchant producers. Today, most of the integrated steel companies now are sellers of pig iron (p. 17) and are competing directly with the merchant operators who once supplied them. An almost complete reversal has occurred.

• • •

The evolution that has occurred in the marketing of merchant iron has its counterpart in every other branch of the metalworking industries. The manufacturer who is making and selling a certain product profitably today cannot be sure that his franchise on the business will be intact a year hence. To insure success over a long period he must be quick to adjust his operations to constantly changing economic conditions. This means that he must size up new developments with an open mind. Blind loyalty to pet ideas and unreasoning prejudice against innovations (p. 29) are responsible for an undue share of the mortalities which occur in business.

Franchise Is Not Permanent

• • •

Chairman Madden of the new national labor relations board got off on the right foot when he emphasized the limitations of the board in dealing with labor disputes. Labor union leaders and new dealers have glorified the Wagner act so far beyond its possibilities that local labor agitators are expecting the board to help them unionize open-shop plants. Already A. F. of L. (p. 25) has filed complaints against a number of companies in the steel and automobile industries. Chairman Madden undoubtedly is wise in warning union leaders not to expect too much from the board. By the time the question of the constitutionality of the act has been thrashed out and the conflict between vertical and crafts unions in A. F. of L. has run its course, the Wagner act may be something less than the magna charta it was supposed to be.

NLRB Not a Panacea

• • •

Machine tool builders will tell you that a good, reliable source of castings suitable for the exacting requirements of modern machine tools is a priceless asset. Foundrymen, with equal frankness, will swear that a steady customer of quality castings who does not expect the impossible is a rarity. However, if builders and foundrymen can get together on the proper basis of understanding and co-operation, remarkable results can be achieved. This has been proved conclusively by the experience of an Ohio builder of turret lathes (p. 32) who has found a small foundry which, in addition to knowing the real meaning of the word "service," has developed some novel ideas in foundry management.

Service With Capital "S"

• • •

Refinement follows refinement in industry today. Customers demand closer adherence to more difficult specifications. Manufacturers, recognizing this trend, are going to great lengths to meet the new requirements. Typical of their efforts in this direction is the action of a steel producer in installing (p. 40) a recently developed "classifier" for sheets and tin plate. This device sorts flat rolled material according to narrow ranges of gage, permitting the seller to meet the specifications of the most meticulous buyer. When critics compare today's prices with those of 10 or 20 years ago, they should make allowance for the greatly improved quality of the material now available. The buyer's dollar goes considerably farther than is generally realized.

Customers Ask More Today

E. L. Shaner

Scrap Again Barometric; Rise In Output, Prices Forecast

SCRAP prices this year evidently have regained some of their lost prestige as a forecaster of iron and steel activity.

All through the depression doubts were cast on these prices as a reliable business indicator. As a barometer, they failed to function according to tradition, probably due to the abnormality of the times, just as some other "reliable indicators" fell by the wayside. After the steel code went in effect, Aug. 19, 1933, of course, they lost practically all significance in relationship to pig iron and finished steel prices.

This year, however, the situation has become different. A strong rise in scrap prices was the forerunner of an increase both in iron and steel production, and in the strengthening of iron and steel prices, especially so since the code has been abolished.

Early Gains Vindicated

For five months—March to July—daily average steel ingot output showed a persistent loss. It was midway in this trend—in May—that scrap prices began to move up. From that time they continued advancing, even while steel production, and also pig iron, were declining.

Spectacular gains in scrap prices week after week apparently were completely at variance with iron and steel activity. Then came August, and "scrap's vindication." Estimated daily average steel ingot output for the month was 25 per cent higher than in July. Finished steel prices made their first advances on a broad front.

Daily average pig iron output for August was up about 6 per cent, and pig iron producers have virtually decided to increase prices after consumers have been given an opportunity to cover requirements for fourth quarter.

Thus, scrap foreshadowed the general rise by at least three months. It was sensitive to underlying currents, while iron and steel production seemingly was misleading.

Whether much or little importance can be attached to this barometrical significance of scrap, there is no mistaking its influence on iron and steel prices today, and the influence it is likely to have on those prices in the near future.

Prices Tell the Story

A few examples will serve to illustrate how scrap prices have rebounded. In April, heavy melting steel was selling in Chicago at $10 a ton. As this is written, the price is $12.75. At Pittsburgh the price of this same grade was $11.50 in April; today it is $14.25. The higher price for this same product at Pittsburgh, incidentally, is due to the fact Chicago pours out scrap and Pittsburgh absorbs it, going as far west as Detroit to get it.

Further east, where there is another outpouring from metropolitan centers, the price of heavy melting is still lower. In eastern Pennsylvania the same commodity in April was $9.75, and today it is $12.00. The advance, therefore, has ranged from $2.25 a ton in eastern Pennsylvania to $2.75 at Pittsburgh and Chicago.

Hydraulic compressed sheets at Pittsburgh in April were selling at $11 a ton, while the current price is $13.25, up $2.25. At Chicago, this same grade was $7.75, and today it is $11.75, an advance of $4 a ton. Similar comparisons all down the scrap list reveal sharp increases.

The net effect of these on STEEL's steelwork scrap price composite was to lift it from the year's low of $10.05 in April to $12.05 in August, a rise of $2. In January, the year's previous high for the composite, the figure was $12.03—an extreme fluctuation here in the year of $1.98.

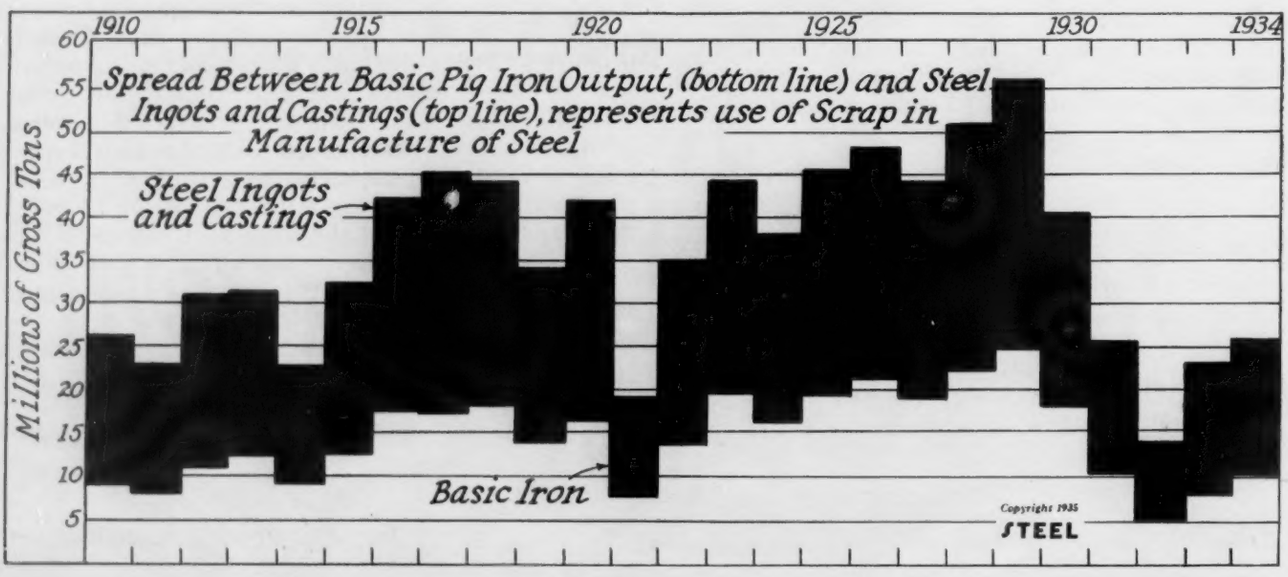
Heavy Melting at $18?

The relatively strong industrial position today has prompted statements at Pittsburgh that heavy melting steel will be selling there this fall at $18, compared with the present range of $14 to $14.50. These statements are based on the relative scarcity of scrap, and a factor which is becoming of increasing concern in the use of scrap—their contamination with alloys, due to the increasing use of alloy steels.

Pig iron producers have looked on all this with much interest. For 15 months their prices have been pegged at one level. It was on June 1, 1934, that they opened books for the third quarter with an advance of $1 a ton. The scrap composite then was $10.32, or $1.65 less than it is today, while pig iron has not budged out of the rut in all these months.

This last assertion must be qualified to say that delivered prices of pig iron did advance this year due to freight surcharges, which proved as much of a disadvantage to producers as to consumers.

The pig iron price given on the ac-



companying chart is an average of No. 2 foundry at Pittsburgh, Chicago and eastern Pennsylvania. As the delivered price at Pittsburgh figures in this compilation, the result was to lift the average price of this grade of pig iron from $19.46 to $19.49—the freight surcharge going in effect in May.

Pig iron producers point out that they made no attempt to increase prices as a result of the increase in freight rates on their raw materials, nor did they make any adjustment following an advance in wages. Higher taxes also are emphasized as a factor. There seems to be no question now about their decision to raise prices early in the fourth quarter—especially since the Guffey coal bill has gone through.

Melters Begin Protecting

One result is being manifested in the pig iron markets already. Foundries and other users of merchant iron are beginning to buy a little farther ahead. The same trend is also being discerned in coke.

Increasing scrap prices and steady pig iron prices are a combination that nearly always leads to the larger use of pig iron. That is one reason why pig iron shipments in August were approximately 35 per cent higher than in July. Inquiries have come out which indicate volume buying of pig iron early in September, and consumers are manifesting much interest in fourth quarter prices.

The spread between production of basic pig iron and steel ingots and castings is shown in an accompanying chart. This clearly indicates the relative proportion of scrap used in making the steel. The proportion has been increasing from the 25-year low reached in 1932. A very slight gain for scrap was made in 1934 over 1933.

Steelmakers, Offering Merchant Iron, Compete with Former Suppliers

CARNEGIE STEEL CO.'s announcement that it had appointed James S. McKesson, until recently vice president of the Corrigan, McKinney Steel Co., Cleveland, special sales agent to handle all its pig iron sales, and its decision "to maintain stocks of bessemer, basic, malleable and foundry irons to meet all requirements of the trade" promises to complicate the merchant pig iron situation.

Mr. McKesson, it is understood, has a 5-year contract, will incorporate his own business, maintain his own headquarters, and presumably also will sell merchant iron for the Illinois Steel Co., which is to be operated from Pittsburgh. There is a possibility that he will also act as sales agent for pig iron for the Tennessee Coal, Iron & Railroad Co., also a subsidiary of the United States Steel Corp.

Follows Other Producers

In this new move Carnegie is doing what Bethlehem Steel Co., Republic Steel Corp., Jones & Laughlin Steel Corp., Youngstown Sheet & Tube Co. — in fact, practically all steelmakers — have been engaged in, in greater or lesser degree, for some time.

The result is to intensify the competition which the regular merchant iron interests, such as Interlake, Davison, Hanna, Snyder, and Hickman-Williams — to mention five — are encountering.

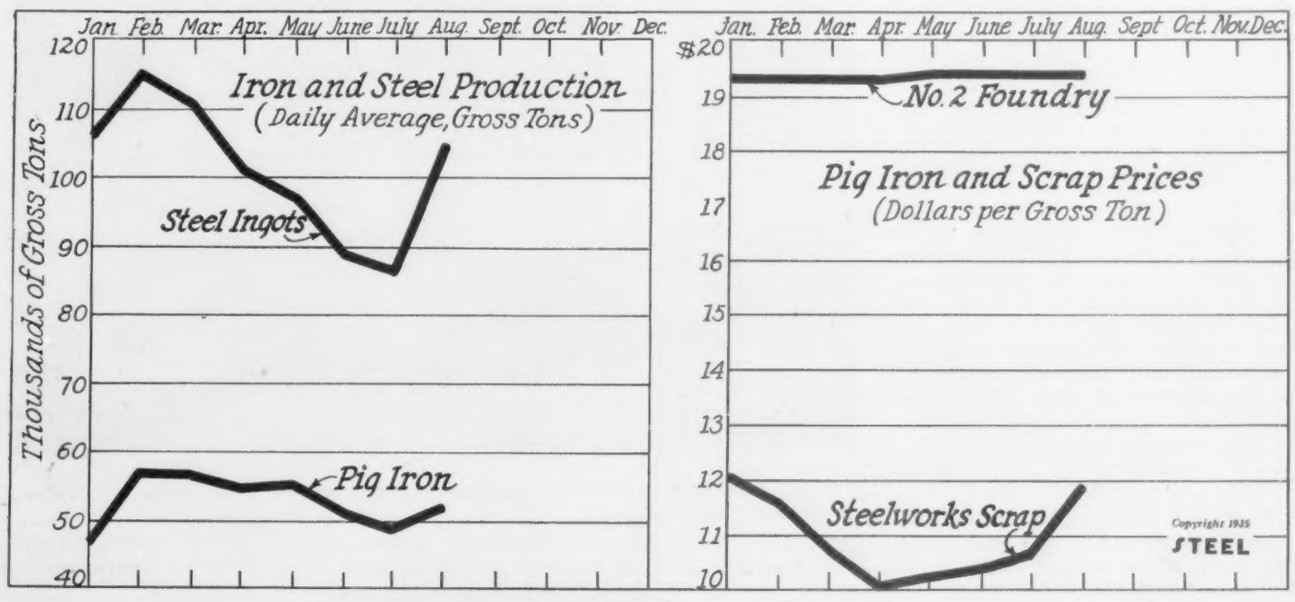
The past 40 years have witnessed almost a complete reversal of the merchant iron business. In the 90's the forerunners of Carnegie, Bethlehem, Jones & Laughlin, Sheet & Tube, and others were small concerns, mainly rolling mills. Few owned iron ore mines, lake freighters, or blast furnaces; mostly they bought their pig iron from the merchant blast furnaces which dotted the countryside.

For about 20 years, the pig iron market was a brisk and broad one. Inquiries for substantial tonnages of iron were frequently before the market, and competition was keen among the powerful brokerage houses which grew up in the larger cities.

Sellers Add Lines

Then came a wave of integration; one by one steel companies became self-contained in respect to pig iron. Many of the fine old pig iron houses passed completely from the picture. The more lusty ones survived, partly by means of taking on such collateral lines as coke and ferroalloys. Many of the larger merchant producers catering to foundries, and also to a few nonintegrated steelmakers, developed their own sales organizations.

During the prosperous 20's the steel industry left its former pig iron sources of supply alone, except for an occasional sale of off iron or "Sunday" iron. But slack times prompted steelmakers to offer anything they made, and gradually they have been competing with the interests that once supplied them.



Merger

MORE than 92 per cent of the 406,708 shares of capital stock of Joseph T. Ryerson & Son Inc., Chicago, was represented at last week's special meeting to consider the recommendation of directors to merge with the Inland Steel Co., Chicago. No dissenting votes against the merger plan were recorded.

Inland stockholders meet Sept. 20 to consider increasing its authorized capital shares, no-par common, to 1,600,000, to issue 240,000 for the acquisition of Ryerson, and to elect four new directors.

Inland is to issue 59/100 of a share of its common for each share of Ryerson, which is continued under its present name and management as a wholly-owned subsidiary of Inland. Edward L. Ryerson Jr., now president of Ryerson, will become one of Inland's principal executive officers, and three present directors of Ryerson will go on the Inland board.

Financial

PETITION has been filed in the federal court at Pittsburgh by the unsecured creditors' protective committee of Follansbee Bros. Co. for reorganization. This is the first of what is expected to be a series of reorganization plans for Follansbee Bros. Co., and no date has been set for a hearing on the plan. Bondholders' committee plans, of which there are two, have not yet been filed.

Part of the filed plan itemizes issuance of $750,000 of new first mortgage bonds in 6 per cent 10-year obligation dated July 1, 1935, and redeemable at 104 plus interest. Proposed capitalization would also include 35,000 shares of 5 per cent $100 par value non-cumulative preferred stock, 330,000 shares of Class A common stock, and 165,000 shares of Class B common.

Present preferred stockholders would be offered 1½ shares of Class A for each preferred share, and the present common holders one share of Class A for each 10 common shares. Present first mortgage bondholders would be offered one share of preferred stock for each $100 of indebtedness and coupons and the unsecured creditors, one share of preferred for each $100 plus 5 per cent interest from date of receivership — May 11, 1934.

WANTS YOUNGSTOWN TO PAY

Preferred and common stockholders of the Youngstown Sheet & Tube Co. were set by the ears last week by an advertisement by Philip T. King, 531 Terminal tower, Cleveland, comparing the financial situation of Sheet & Tube with the United States Steel Corp., Bethlehem Steel Corp. and Republic Steel Co. Claim was made that immediate resumption of the preferred dividend is justified, and a plan for clearing up back preferred dividends was submitted.

SENECA RETIRES PREFERRED

Seneca Wire & Mfg. Co., Fostoria, O., has called all of its preferred stock as of Oct. 1. Necessary funds have been accumulated from earnings.

GRANITE CITY PAYING 25c

Granite City Steel Co., Granite City, Ill., will pay 25 cents a share on its common stock Sept. 30 to record of Sept. 17. Current operations are 50 per cent.

ACME AGAIN PAYS EXTRA

Acme Steel Co., Chicago, has declared the regular dividend of 50 cents and also an extra of 12½ cents on its common stock Oct. 1 to record of Sept. 16. This duplicates the July 1 payment.

AUTO ACTIVITY AIDS YOUNG

L. A. Young Spring & Wire Corp., Detroit, reports net profit of $1,067,585 in the first half year—largest net since the first half of 1929, when the profit was $1,524,325.

Cliffs Stock Sale Hints at Ore as an Inflation Hedge

EASTERN capitalists and bankers are understood to have acquired a substantial interest in the Cleveland-Cliffs Iron Co., Cleveland, through a purchase of common stock of the Cliffs Corp., a holding company, and one explanation is that iron ore, being an irreplaceable material, is regarded as a hedge against inflation.

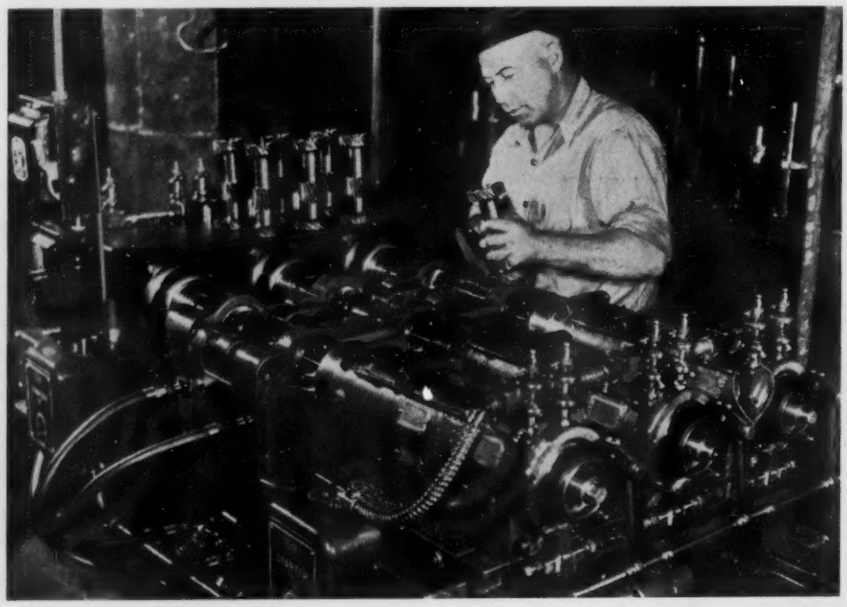
The transaction was a personal one by a Cliffs Corp. stockholder, and does not involve any of the stock held in the portfolio of the Union Trust Co., Cleveland, which is being liquidated. A rumored refinancing plan to clarify and strengthen the position of Cleveland-Cliffs by terminating its bank loans is said to be unrelated to this sale.

Cleveland-Cliffs operates iron ore properties having an annual capacity of 4,500,000 tons, and a lake fleet, fourth largest in size and having a trip capacity of 164,600 tons. Its coal mines can produce 300,000 tons annually. A charcoal blast furnace at Marquette, Mich., has been idle since 1931.

Dismantling

HETZ Construction Co., Niles, O., has been awarded the contract for razing the seven, 60-ton stationary open-hearth steel furnaces and

Buick Expansion Draws on Transvaal



In this new diamond boring machine, regarded as one of the finest precision tools used in the automobile industry, diamond faced tools bore out six counter gears for transmissions simultaneously. This machine is part of the $14,500,000 expended by the Buick Motor Co. at Flint, Mich., in its expansion program for 1936 models (see p. 23)

the two bessemer converters at the Newburgh works of the American Steel & Wire Co. in Cleveland. Other equipment is being dismantled and shipped to other United States Steel Corp. subsidiaries.

For several years the Newburgh steelworks has been idle, and semi-finished steel for the various Cleveland manufacturing plants of American Steel & Wire has been brought in from the Lorain, O., plant of the National Tube Co., also a subsidiary of the Steel corporation.

The American Salvage & Trading Co., Cleveland, is now razing two Central blast furnaces of American Steel & Wire at Cleveland, leaving two standing.

Meetings

MILWAUKEE Association of Purchasing Agents has scheduled its second industrial products exhibit for Oct. 22-23 at the Schroeder hotel, Milwaukee. All space available, which is considerably more than a year ago, already has been sold to about 150 exhibitors. A banquet will be held Oct. 22. G. L. Hartman, of the Oilgear Co., Milwaukee, is chairman of the exhibit committee.

Steel Corp. Plans Await Carnegie-Illinois Unification

NEW YORK

MUCH official silence follows in the wake of the United States Steel Corp.'s announcement ten days ago of the unification of its subsidiaries—Carnegie Steel Co., Pittsburgh, and Illinois Steel Co., Chicago—to become effective Oct. 1 under the leadership of Benjamin F. Fairless, who recently resigned as executive vice president of the Republic Steel Corp., Youngstown, O.

Virtually the only additional news has come in the announcement of appointment of James S. McKesson, formerly vice president and general sales manager of the Corrigan, McKinney Steel Co., as special agent to handle exclusively all sales of pig iron for Carnegie (see p. 17), and another telling of the engagement of Batten, Barton, Durstine & Osborn, New York, as advertising agents of the United States Steel Corp. and its subsidiaries, effective Jan. 1, 1936.

The Carnegie-Illinois move is regarded as the first major step in a more general unification later of properties and subsidiaries of the Steel corporation, with a greater concentration of control at Pittsburgh and the transfer of certain of the New York activities to other centers.

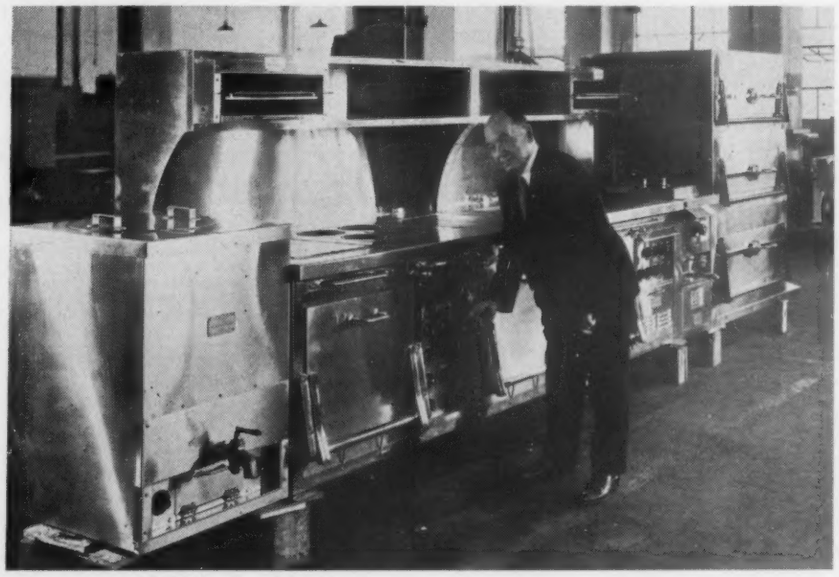
But it is believed doubtful if any further announcements that may come out over the remainder of this month, or until the Carnegie-Illinois consolidation becomes effective, will bear on many other phases of the general program than those relating to this specific development; and even then, according to some opinion, it would not prove surprising if statements were confined to such pertinent details as the name of the combined organization, the official title of Mr. Fairless, and certain other major changes in personnel.

Changes Will Be Slow

Until Mr. Fairless himself has had first-hand opportunity to study the problems incident to merging the two subsidiary companies, it is expected that changes will come slowly, and that, further, the whole process of unification of certain of other subsidiaries may, in a relative sense, mark time until many of the major details of the present consolidation have been ironed out.

It is also believed likely that first attention will be directed to production problems, with sales and general merchandising to follow later. However, the management has steadfastly refused, insofar as the general scheme of its program is concerned, to amplify its statement of the other day.

Will Supply "More Abundant Life" in White House



On this polished stainless steel and chrome plate all-electric kitchen range will be prepared the entire gamut of White House menus, from President Roosevelt's Sunday evening scrambled eggs to pate-de-fois-gras for state banquets. It was recently installed in the rebuilt White House kitchen by the Edison General Electric Appliance Co., Chicago. The equipment includes electric ranges, stock and fry kettles, ovens, griddles, hot plates and other units. The equipment is flexible so that it can be used personally by Mrs. Roosevelt, or for demands which will tax its capacity of 125 pounds of meat in the roasting ovens, 20 loaves of bread or 9 pies each in the baking ovens, and 60 pounds of meat in the range ovens. George A. Hughes, president of the Edison company (the Hotpoint Co.), is shown inspecting the stainless steel and chromium finished product before it was shipped to Washington

Pittsburgh Looking For Developments

PITTSBURGH

A TENSE feeling prevailed among personnel of subsidiary companies of United States Steel Corp. at Pittsburgh through last week, following the terse announcement of the week before effecting a sweeping change in the corporate setup of both Carnegie Steel Co. and Illinois Steel Co.

Few details followed in the steps of the earlier announcement that Benjamin F. Fairless, former executive vice president of Republic Steel

Corp., would head the consolidation of the Carnegie and Illinois companies.

Presumably, details on how the consolidation will be worked out are in the minds of a few high Corporation executives. It would be safe to say that this group includes few others than Myron C. Taylor and W. A. Irvin, board chairman and president of the Corporation, respectively; W. J. Filbert, chairman of the finance committee, and Mr. Fairless himself.

Rumors in Pittsburgh last week to the effect that Mr. Fairless has been taken on by the Corporation chiefly as an organizer and that his efforts —as soon as the Illinois-Carnegie consolidation is effected—would be directed to other Corporation subsidiaries were generally discredited.

In responsible circles it is believed that Mr. Fairless' position as head of the Carnegie-Illinois group will be permanent. It is generally conceded that the appointment of Mr. Fairless is but the first step of several to follow, and, presumably, one of the conditions which brought him as head of the Carnegie-Illinois consolidation was that he would have free rein in making his changes to set up these important Corporation subsidiaries on the new basis.

Disentangle Old Companies

For the past three or four months, and even longer, efforts have been made in Pittsburgh, as elsewhere in important Corporation manufacturing centers, to straighten out many details of Corporation subsidiary identities. The existence of many old holding companies, New Jersey and Delaware incorporations, and interlocking manufacturing facilities has been a problem that doubtless will take many more months to complete.

The Corporation has been gradually merging various units of the Lorain Steel Co., Johnstown, Pa., with Carnegie, and at the same time the many holding companies going into making up the Carnegie interests have been in process of disentanglement.

For example, the Clairton Steel Co., Federal Steel Co., Carnegie Steel Co. of New Jersey, Carnegie Steel Co. of Delaware, etc., have all entwined to make up what is popularly known as the Carnegie Steel Co. To straighten out this overlapping identity has been one task now in process which will soon confront Mr. Fairless.

As previously announced, Illinois' order and production departments will be moved to Pittsburgh, and there was some conjecture in Pittsburgh steel circles last week as to whether this would mean a complete removal of other Illinois detail functions such as the purchasing department, etc., also to Pittsburgh.

July Steel Imports Show Small Decline

FOR the second consecutive month imports of steel and iron products into the United States fell off in July, the 31,894 gross tons of imports being 3.9 per cent lower than the 33,208 tons imported in June, according to the metals and minerals division of the department of commerce.

However, July imports were 88 per cent higher than in July, 1934. Total imports of 214,785 gross tons for seven months of 1935 were 16 per cent greater than for the corresponding period of 1934.

Gains and losses in individual classifications were fairly evenly balanced. Pipe declined 1397 tons, structural shapes 1272 tons and pig iron 1064 tons. Cotton ties made the largest gain, 2211 tons, ferromanganese 1809 tons, rails and fastenings 634 tons.

Belgium supplied the largest import tonnage with 8015 tons, with Germany second with 7660 tons, Canada third with 6630 tons and British India fourth with 3257 tons.

Details of steel and iron exports for July were presented in STEEL, Sept. 2, page 32.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1935		1934	
	Imports	Exports	Imports	Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
Mar.	21,409	323,035	38,393	261,269
April	28,866	205,336	26,862	201,539
May	47,719	286,598	29,465	241,753
June	33,208	289,687	24,848	219,406
July	31,894	296,802	17,676	233,186
7 mo	214,785	1,892,736	185,297	1,486,367
Aug.	.....	.....	32,418	242,947
Sept.	.....	.....	23,847	301,330
Oct.	.....	.....	20,202	220,209
Nov.	.....	.....	35,272	299,263
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764

ORIGIN OF JULY IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Germany	50	14	.....
Netherlands	276	.....	.....
Norway	25	.....	880
Soviet Russia	200	4,161	.....
Sweden	100	.....	.....
United Kingdom	1,148	18	200
Canada	463	24	4,552
British India	3,257	2,240	.....
British West Africa	.....	9,669	.....
France	.....	.....	257
Italy	.....	.....	33
Poland-Danzig	.....	.....	40
Total	5,519	16,126	5,962

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Austria	8	.....	5	.....
Belgium	636	2,700	.....	727
Germany	29	110	5	451
Switzerland	4	.....	.....	.....
United Kingdom	4	.....	21	3
France	.....	312	.....	23
Czechoslovakia	.....	.....	2	.....
Soviet Russia	.....	.....	2	.....
Sweden	.....	.....	440	1
Canada	.....	.....	2	.....
Netherlands	.....	.....	.....	6
Poland-Danzig	.....	.....	.....	79
Total	681	3,122	477	1,290

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	July, 1935	June, 1935	Jan. thru July, '35
Pig iron	5,519	6,583	59,005
Sponge iron	.....	204	666
Ferromanganese and spiegeleisen (1)	5,962	4,153	28,490
Ferrochrome (2)	.....	.....	1
Ferrosilicon (3)	38	52	556
Other ferroalloys	.....	.....	1
Scrap	1,584	2,417	13,640
Steel ingots, blooms, etc.	35	28	1,067
Concrete bars	721	300	1,529
Hollow bar, drill steel	102	66	573
Merchant steel bars	477	324	8,307
Bars, solid, hollow (6)	1,776	1,187	4,857
Iron slabs	.....	.....	.....
Iron bars	284	317	918
Wire rods	937	722	8,111
Boiler and other plate	79	94	246
Sheets, skelp, saw plate	681	1,286	4,663
Tin plate	5	1	106
Structural shapes	3,122	4,394	20,603
Sheet piling	.....	.....	.....
Rails and fastenings	819	185	2,463
Cast iron pipe, fittings	.....	27	27
Malleable iron pipe fittings, advanced	.....	.....	46
Welded pipe	492	361	1,407
Other pipe	1,777	3,174	9,893
Cotton ties (5)	2,211	.....	3,954
Other hoops and bands	1,290	2,517	12,364
Barbed wire	1,390	2,344	14,712
Round iron, steel wire	224	488	2,408
Telegraph, telephone wire	3	4	20
Flat wire, strip steel	65	97	868
Wire rope and strand	138	123	1,058
Other wire	187	40	624
Nails, tacks, staples	1,841	1,542	10,333
Bolts, nuts, rivets	28	56	226
Horse and mule shoes	35	28	381
Castings and forgings	72	94	662
Total	31,894	33,208	214,785

(1) Manganese content.
(2) Chrome content.
(3) Silicon content.
(4) Alloy content.
(5) New class, no comparable figures for 1934 or previous years.
(6) New classification as result of the reciprocal trade agreement with Belgium. No comparable figures for previous month or year.

Metal Lath Standard Is Reaffirmed

Division of simplified practice of the national bureau of standards, Washington, has announced that simplified practice recommendation R3-28 metal lath has been reaffirmed without change by the standing committee of the industry.

This recommendation, which establishes a simplified schedule of stock sizes and varieties of metal lath, was originally effective July 1, 1924, and was revised, effective Jan. 1, 1928.

Copies of this simplified practice recommendation may be obtained from the superintendent of documents, government printing office, Washington, at 5 cents each.

August Pig Iron Up 15.7 Per Cent; 98 Stacks 1935 High

PRODUCTION of coke pig iron in the United States in August registered substantial increase. Total and average daily output each showed gains of 15.7 per cent over July; at the same time, operating blast furnaces increased by 6 stacks, raising the total to 98, a figure which was the highest for any month in 1935 and the best since May, 1934, with 117 active units. Several additional furnaces are known to have resumed operation in September.

During the period from May 31 to Aug. 31, 1934, operating blast furnaces made a precipitate drop from 117 to 61, a loss of 56 stacks. From the total of 117, active units dropped to 92 in June, 74 in July and 61 in August. During the 3-month period of this year, the total increased from 96 to 98, a gain of 2 stacks. The June figure was 91 and the July figure 92.

Average daily production in August was 56,767 gross tons, which, compared with the daily rate of 49,043 tons in July, was a gain of 7724 tons. This was the best monthly rate recorded since last March with 57,120 tons and the third highest for the year. The rate in August, one year ago, was 34,199 tons.

Total output for August was 1,759,782 gross tons, an increase of 239,442 tons over the 1,520,340 tons made in July. Both months had 31 days. The August production was the best since March with 1,770,990 tons, and compares with 1,060,187 tons in August, 1934.

For the 8-month period, 1935 production has aggregated 13,110,056 gross tons, against 12,141,339 tons in the corresponding period of 1934, the increase being 968,717 tons, or approximately 8 per cent. The 1933 total for 8 months was 8,079,360 tons.

Relating production to capacity, August had an operating rate of 40.7 per cent, as compared with 35.2 per cent in July, 37.2 per cent in June and 40.2 per cent in May. The rate was 24.5 per cent in August, one year ago, and 42.8 per cent in August, 1933.

During August, 11 furnaces resumed and 5 were blown out or banked. Of the steelworks or nonmerchant group, 7 resumed and 3 were taken out; of the merchant group, 4 were blown in and 2 blown out.

Furnaces resuming in August were: In Ohio: Hubbard No. 1, Youngstown Sheet & Tube Co. In Pennsylvania: One Eliza, Jones & Laughlin Steel Corp.; Isabella No. 1, Carnegie Steel Co.; Shenango No. 1, Shenango Furnace Co. In New York: Troy, Troy Furnace Corp.; Niagara A, Tonawanda Iron Co. In Alabama: City No. 1, Sloss-Sheffield Steel & Iron Co.; Fairfield No. 6, Tennessee Coal, Iron & Railroad Co. In Illinois: South Works New No. 9, Illinois Steel Co. In Indiana: Madeline No. 3, Inland Steel Co.; Indiana Harbor No. 1, Youngstown Sheet & Tube Co.

Stacks blowing out or banking were: In Ohio: Anna, Struthers Iron & Steel Co.; Mingo No. 4, Carnegie Steel Co. In New York: Standish, Chateaugay Ore & Iron Co. In Illinois: South Works Old E, Illinois Steel Co. In Indiana: Indiana Harbor No. 2, Youngstown Sheet & Tube Co.

Since the first of September, Youngstown Sheet & Tube Co. has relighted a furnace at its Campbell plant in Campbell, O., and Globe Iron Co. has blown in its Globe stack in Jackson, O. The latter has been idle since August, 1934. An additional steelworks stack has gone into operation in the Chicago district.

AVERAGE DAILY PRODUCTION

Gross Tons

	1935	1934	1933	1932
Jan.	47,692	39,537	18,348	31,336
Feb.	57,675	45,385	19,752	33,122
Mar.	57,120	52,438	17,484	31,194
Apr.	55,719	57,873	20,786	28,524
May	55,986	66,370	28,784	25,282
June	51,949	64,563	42,165	20,867
July	49,043	39,630	58,108	18,394
Aug.	56,767	34,199	59,137	17,035
Sept.		29,969	50,264	19,788
Oct.		30,689	43,824	20,795
Nov.		31,930	36,124	20,858
Dec.		33,161	38,456	17,650
Ave.	53,950	43,774	36,223	23,699

MONTHLY IRON PRODUCTION

Gross Tons

	1935	1934	1933
Jan.	1,478,443	1,225,643	568,785
Feb.	1,614,905	1,270,792	553,067
Mar.	1,770,990	1,625,588	542,013
Apr.	1,671,556	1,736,217	623,606
May	1,735,577	2,057,471	892,326
June	1,558,463	1,936,897	1,264,953
July	1,520,340	1,228,544	1,801,345
Aug.	1,759,782	1,060,187	1,833,265
Tot. 8 mo.	13,110,056	12,141,339	8,079,360
Sept.		899,075	1,507,931
Oct.		951,353	1,358,540
Nov.		957,906	1,083,740
Dec.		1,028,006	1,192,136
Total		15,977,679	13,221,707

AUGUST IRON PRODUCTION

	No. in blast last day of Aug.	July	Total tonnage Merchant	Nonmerchant
Ohio	24	25	69,286	403,325
Penna.	31	28	46,096*	442,324*
Alabama	6	4	51,315	26,954
Illinois	7	7	43,682	118,604
New York	8	7	46,693	82,007
Colorado	1	1		
Indiana	8	7	7,306*	275,120
Maryland	3	3		
Virginia	1	1		
Kentucky	2	2		
Mass	0	0		
Tennessee	0	0		
Utah	1	1	7,177	139,893
West Va.	2	2		
Michigan	4	4		
Minnesota	0	0		
Missouri	0	0		
Total	98	92	271,555*	1,488,227*

*Includes ferro and spiegeleisen.

RATE OF OPERATION

(Relation of Production to Capacity)

	1935[1]	1934[2]	1933[3]	1932[4]
Jan.	34.2	28.3	13.3	22.1
Feb.	41.4	32.5	14.3	23.4
Mar.	41.0	37.5	12.7	22.0
Apr.	40.0	41.4	15.1	20.2
May	40.2	47.5	20.9	17.9
June	37.2	46.3	30.6	14.7
July	35.2	28.4	42.4	13.0
Aug.	40.7	24.5	42.8	12.0
Sept.		21.5	36.4	14.0
Oct.		22.1	31.8	14.7
Nov.		22.8	26.2	14.7
Dec.		23.7	27.9	12.5

[1]Based on capacity of 50,845,741 gross tons, Dec. 31, 1934; [2]capacity of 50,975,561 tons, Dec. 31, 1933; [3]capacity of 50,313,975 tons, Dec. 31, 1932; [4]capacity of 51,598,175 tons, Dec. 31, 1931. Capacities by American Iron and Steel institute.

Charters Train to Show

Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, has chartered a special Big Four train to take its employes to the Cleveland machine tool show Sept. 14. A $3 rate, less than half the actual cost, has been made to employes, and it is expected that nearly 700 will go.

NORTHWESTERN FILES ISSUE

Northwestern Barb Wire Co., Sterling, Ill., of which P. W. Dillon is president, has filed with SEC in Washington a registration statement for a $1,250,000 first mortgage 5½ per cent sinking fund bond issue, 40,000 stock purchase warrants and 40,000 shares of $5 par common stock.

Production

STEELMAKING eased fractionally last week to 52 per cent, due largely to holiday influences. This marks the first break in the rising trend since the second week of July, when the industry operated at 38 per cent. Youngstown and eastern Pennsylvania both went down last week, while Pittsburgh, Wheeling and Birmingham showed an increase. Other districts held fairly steady. Further details follow:

Youngstown — Down 2 points to 60 per cent last week, and tentative schedules for this week show a further small decline to 58 per cent at the start. Youngstown Sheet & Tube Co. is expected to start the bessemer plant at its Campbell works soon.

Pittsburgh—Up 1 point to 45 per cent, because of the improvement through the week by the leading interest which operated at 43-45 per cent. The leading independent continues at better than 50 per cent of its ingot capacity, and many of the smaller producers are experiencing higher operations. Twenty-three out of 60 steelworks blast furnaces are active. Carnegie Steel Co. operated 9 of 32, Jones & Laughlin Steel Corp. 7 of 11; Bethlehem Steel Co. 3 of 7, and American Steel & Wire, National Tube, Pittsburgh Crucible Steel and Pittsburgh Steel companies, 1 each.

Chicago—Unchanged at an average of 57 per cent for the abbreviated week. Operations largely were suspended on Labor day. Blast furnace schedules have been raised by the lighting of one steelworks stack, giving the district 14 out of 36 units active. Two merchant furnaces continue in blast.

Cleveland—Held at 56 per cent last week, Corrigan-McKinney operating nine, Otis five, and National Tube eight. For this week National Tube is expected to put on four additional open hearths and take off the bessemers which have been active.

Wheeling—Up 6 points to 84 per cent through last week. A leading interest is operating at capacity. Thirty-one of 37 open-hearth furnaces are on schedule.

Central eastern seaboard—Off fractionally to 32 to 33 per cent, the first set-back in a number of weeks. The present outlook is for an advance.

New England—Off 3 points to 70 per cent, with indications of recovery this week. Production in August was at 57 per cent.

Buffalo—Off 5 points to 32 per cent, owing to curtailed production over the holiday. Twelve of 38 open hearths are on.

Birmingham—Jumped another 5 points last week to 45½ per cent, due to heavier schedules.

Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended Sept. 7	Change	Same week 1934	Same week 1933
Pittsburgh	45	+ 1	8	35
Chicago	57	None	23	45
Eastern Pa.....	32½	—½	15½	37
Youngstown...	60	— 2	23	45
Wheeling	84	+ 6	23	75
Cleveland	56	None	24	56
Buffalo	32	— 5	18	48
Birmingham..	45½	+ 5	25	50
New England	70	— 3	25	85
Detroit	94	None	77	55
Average	52	—½	18	42

August Ingots 24 Per Cent Over July

AVERAGE daily ingot production of 108,123 tons in August is nearly 24 per cent higher than in July and more than 110 per cent larger than in August, 1934, according to the American Iron and Steel Institute.

Daily production of August was exceeded only in February and March of this year. Percentage of capacity engaged in August was 48.84, this also being higher than any month this year except February and March.

Total calculated production in eight months this year is 21,214,241 gross tons, compared with 19,273,357 tons in the same period of 1934.

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 97.91 per cent

	Open Hearth Gross tons	Open Hearth Per cent of capacity	Bessemer Gross tons	Bessemer Per cent of capacity	Total Gross tons	Total Per cent of capacity	Calculated daily production, all companies (gross tons)	Number of working days
1935								
Jan.	2,631,673	49.73	239,858	34.99	2,871,531	48.04	106,353	27
Feb.	2,553,429	54.28	224,336	36.82	2,777,765	52.28	115,740	24
Mar.	2,637,331	51.75	230,810	34.97	2,868,141	49.83	110,313	26
Apr.	2,408,588	47.27	231,916	35.14	2,640,504	45.87	101,558	26
May	2,381,061	44.99	254,796	37.17	2,635,857	44.10	97,624	27
June	2,020,406	41.23	210,487	33.17	2,230,893	40.31	89,236	25
July	2,045,768	40.15	224,456	34.01	2,270,224	39.44	87,316	26
Aug.	2,685,965	50.76	233,361	34.05	2,919,326	48.84	108,123	27
8 mo.....	19,364,221	47.52	1,850,020	35.04	21,214,241	46.09	102,033	208
1934								
Jan.	1,824,640	34.69	172,489	25.17	1,997,129	33.59	73,968	27
Feb.	2,036,071	43.55	175,873	28.87	2,211,944	41.86	92,164	24
Mar.	2,594,536	49.33	203,904	29.75	2,798,440	47.07	103,646	27
Apr.	2,678,582	55.00	257,482	40.57	2,936,064	53.34	117,443	25
May	3,067,874	58.33	331,620	48.38	3,399,494	57.18	125,907	27
June	2,776,891	54.83	282,592	42.81	3,059,483	53.44	117,672	26
July	1,369,584	28.12	119,869	18.89	1,489,453	27.06	59,578	25
Aug.	1,271,752	24.18	109,598	15.99	1,381,350	23.24	51,161	27
8 mo.....	17,619,930	43.50	1,653,427	31.30	19,273,357	42.09	92,692	208
Sept.	1,151,362	23.64	117,615	18.53	1,268,977	23.05	50,759	25
Oct.	1,354,113	25.75	127,789	18.64	1,481,902	24.93	54,885	27
Nov.	1,478,566	29.19	132,059	20.01	1,610,625	28.13	61,947	26
Dec.	1,832,790	37.63	131,467	20.72	1,964,257	35.68	78,570	25
Total.....	23,436,761	38.68	2,162,357	27.39	25,599,118	37.38	82,312	311

Capacity percentages for 1935 are based upon open-hearth capacity of 60,954,717 tons and bessemer of 7,895,000 tons on Dec. 31, 1934; for 1934 based on open-hearth capacity of 60,583,813 tons and bessemer of 7,895,000 tons on Dec. 31, 1933

CANADIAN IRON AND STEEL OUTPUT MOUNTS IN JULY

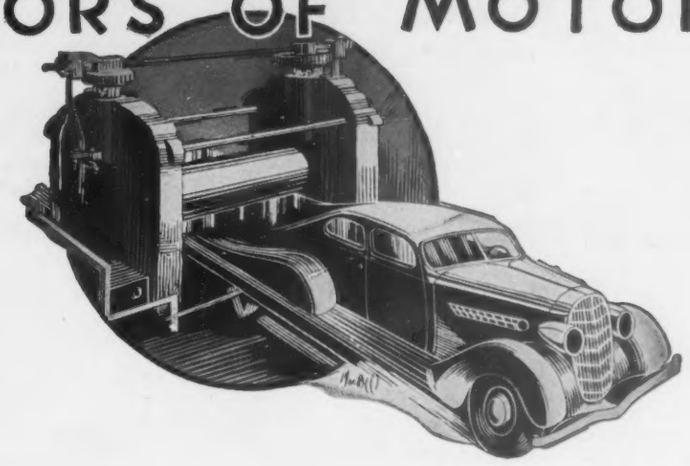
Canadian output of steel ingots and direct steel castings rose from 73,450 tons in June to 86,101 tons in July. Pig iron production in July was 50,513 tons, which compares with 44,555 tons in June. Production of ferroalloys amounted to 7269 tons, as against 3845 tons in June.

For the seven-month period ending with July, steel ingots and castings totaled 474,264 tons, a slight gain over last year's figure of 464,169 tons; pig iron amounted to 310,290 tons, a considerable improvement over the 194,586 tons for the same period of last year; and ferroalloys output was 29,461 tons, or more than double the 14,619 tons produced in the corresponding months of 1934.

TINNED BEER PEPS OPENING

In opening its new, and 40th, plant in Elwood, Ind., Aug. 24 the Continental Can Co. distributed thousands of cans of beer, using its new tin container, which is closed with an ordinary bottle cap and permits the beer to be drunk from the can. The Elwood plant will make cans for vegetables and milk.

MIRRORS OF MOTORDOM



DETROIT

NEW 1936 Buicks, with which dealers are now being stocked, disclose an imposing array of refinements, with those in the bodies making for safety and comfort probably predominating.

Contrary to the present trend, which finds most other manufacturers close to the end of their run on 1935 jobs, closed, or preparing to resume on their new series, Buick is stepping up its production rapidly.

It has passed a weekly rate of 1500 units on the way up; is increasing as rapidly as the flow of parts to the assembly lines will permit; and it is now expected that most dealers will be able to show the new series about Sept. 15 or shortly thereafter.

Numbers Now Names

Instead of designating its various series as the 40, 50, 60 and 90, as in 1935, the new cars are labeled Special, Century, Roadmaster and Limited, starting from the bottom of the line and going up.

Wheelbases, engine dimensions, and tire sizes are practically unchanged. In most localities the new models are expected to deliver for no more than the comparable 1935 series, and formal announcement of prices may even disclose slight reductions.

The more important body features are:

The top is all-steel, of the Fisher turret type.

Fisher no-draft ventilation is retained.

Windshields and rear windows are divided.

The radiator grille is a zinc die casting, in general outline similar to the 1935 Olds except that the bead on all edges is considerably wider.

Louvres are also reminiscent of the 1935 Oldsmobile type, covered by a number of horizontal bright strips.

The nameplate is a bright red medallion on which appears the name Buick, mounted on the upper right half of the radiator grille; a similar medallion is mounted on the center of the trunk; these medallions also serve as reflectors at night.

Bumpers front and rear and the larger, bright hub caps are fluted horizontally. Bumpers do not dip in the center.

Such equipment as windshield wipers, tail lights, and horns (enclosed) are dual.

Mounted on the front fenders, which like the rear fenders have a creased center line, are elongated parking lamps, which, like the head lamps, are of the airplane fuselage type.

Front fenders more closely hug the wheels, and come down further in front. Rear fenders also are more pronouncedly streamline. A bright beading runs, as in 1935, from the rear fender along the edge of the running board to the front of the front-fender skirt.

Trunks are standard equipment on all models, with the spare tire stored flat in the lower compartment, except on the deluxe four-door sedan which comes with two front fender wells. However, wells may be had on any model.

A contrasting color bead or molding runs from the rear quarter to the radiator grille.

All front doors are hinged at the front.

Arm rests on the interiors of front doors are slotted to permit their use for easier closing of doors.

A clock is standard equipment on the door of the glove compartment at the right.

Balanced Dashboard Evolved

Gasoline and oil pressure gages, heat and other indicators are grouped as a unit around and integral with the speedometer directly in front of the driver, comprising a panel that balances the clock mounted in the glove compartment door.

A roomier front seat compartment is obtained by hanging the emergency brake lever underneath the instrument board at the left of the driver.

The steering wheel is flexible, to ease road shocks. Each of the three spokes of the wheel consists of five rods which are spaced farther apart at the post than at the rim.

The seat in the business coupe is hinged to permit access to an extra seat directly behind the driver.

Radio aerials are now mounted underneath the car, due to adoption of the steel top.

A new color that will be featured is a lustrous gun-metal, with a contracting scarlet body molding.

The principal mechanical features are:

Brakes are hydraulic, internal-expanding, with two self-energizing shoes. The emergency brake is mechanical external-contracting, mounted on the rear wheels, with the lever below the dash at the left of the driver, as previously mentioned.

Goes to Aluminum Pistons

Pistons are Anolite aluminum alloy with four rings, split skirt, and invar strut.

The generator is air-cooled, belt driven, and mounted on the left of the engine.

A solenoid arrangement provides automatic starting by depressing the accelerator pedal.

The extremely flat gas tank at the rear is non-syphonable.

Knee-action springs have been retained for front wheels; rear semi-elliptic springs are mounted off-center, with the longer section to the rear of the axle.

A new oil-cushion hood completely silences the valve-in-head engine —a feature that will be greatly stressed.

Metal covers are standard on all rear springs.

The ride stabilizer has been moved from the rear to the front wheels.

Fuel pump and gasoline strainer have been moved from the left to the right side of the engine.

With Monday out on account of the holiday, assembly of passenger cars and trucks last week declined to 34,140, the lowest in 38 weeks.

Since Chevrolet and Ford have been accounting for about 80 per cent of recent production and both are heading into the changeover

period, daily average production is likely to ease off for several weeks at least.

September may not equal the 170,007 units produced a year ago, but considering the model rather than the calendar year owing to the advance in the showing of new models, September is more comparable with last November, when only 83,482 units were assembled.

Notwithstanding the certain September softness in production, the industry will come up to Oct. 1 with between 2,900,000 and 3,000,000 units having been assembled. This compares with 2,753,111 in all 1934, and 1,920,057 in all 1933. With October and early November, at least, a heavy production period, it still is possible for 1935 to be a 3,500,000-car year.

Plants that were closed last week include Hudson-Terraplane, Lincoln, Chrysler, DeSoto, Plymouth, Pontiac, and Olds. Of course, in all some departmental work was in process, but assembly lines were down. Dodge was closed on passenger cars but still was assembling trucks, 1200 last week.

Even though there will be comparatively few changes in some of the lines just mentioned, the transition period will be a little longer than originally expected.

Chevrolet Still on 1935

It will be late September, possibly early October, before DeSoto, Plymouth and Pontiac resume. Chrysler and Hudson-Terraplane may resume shortly after Sept. 15. Olds also is probably a late September or early October starter.

A late starter on 1935 models, Chevrolet is also a late closer. Last week it turned out 11,000 units, the gear and axle and some other divisions meanwhile getting up speed on 1936 parts.

Ford, which last week held a sales meeting at San Diego, Calif., and a merchandise and service meeting at Atlantic City, N. J., assembled 14,000 jobs. Like Chevrolet, it is nearing the end of its run for 1935. The few rumors that seep out of the Rouge plant all agree that a larger, roomier Ford is approaching for 1936.

Out at Los Angeles last week Edsel Ford in a newspaper interview again gave a hint of what Ford engineers have in the back of their minds. He said:

"The next big development will be rear engine designs, with all driving mechanism behind. That will prevent the driveshaft from cluttering up a low-frame car, and keep the noise and smell out of the front seat."

That is not conclusive, because Ford engineers are constantly experimenting with almost every conceivable automotive development, but it may be a straw, especially since Edsel's participation in Ford decisions is increasing.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,817
Feb.	105,447	230,256	335,700
Mar.	115,272	338,434	429,834
Apr.	176,432	352,975	477,746
May	214,411	330,455	364,727
June	249,727	306,477	361,320
July	229,357	264,933	337,049
Aug.	232,855	234,811	*220,000
8 mos.	1,442,326	2,214,007	2,819,193
Sept.	191,800	170,007	.....
Oct.	134,683	131,991	.....
Nov.	60,683	83,482	.....
Dec.	80,565	153,624	.....
Year	1,920,057	2,753,111	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Aug. 24	50,585
Aug. 31	49,115
Sept. 7	34,140

Packard has snapped back rapidly on the larger 1936 series and is about to begin the 1936 run on the smaller series. Last week it assembled over 500 jobs, practically all the large series.

Packard's comeback this year has been phenomenal, due chiefly to the 120 series; in seven months it made 27,500 units, compared with 3100 in the comparable period of 1934.

Graham will continue through the greater part of September on 1935 jobs, assembling about 350 weekly. Hupp is closing this week.

Of manufacturers outside of Detroit, Studebaker is assembling about 1200 weekly and Nash-LaFayette 1800, while Pierce-Arrow has gone down for its model change, which will involve principally the straightening out of some lines.

Aluminum Block for Auburn

Auburn, whose weekly rate has been 250 units, last week staged a mass meeting of its suppliers. There was no particular joy among pig iron sellers, because Auburn is strongly aluminum-minded in regard to the new model which will mount a Cummins diesel engine. The cylinder block, crankcase, cylinder head and valve cover all are Bohnalite castings. In fact, the usual order is reversed, the block being aluminum alloy and the pistons cast iron.

An eight-cylinder air-cooled car is planned by Franklin Motors Inc., Syracuse, N. Y., which last December purchased the assets of the defunct H. H. Franklin Mfg. Co.

It is probable, however, that the reopening of the Franklin plant Sept. 16 will precede by some time the actual production of the new car. Air-cooled and air-conditioned refrigeration will also be manufactured at Syracuse.

Dallas E. Winslow, Detroit, of the Copeland Refrigeration Corp., has been elected chairman of the Franklin Automobile Co., which is the sales organization of the former H. H. Franklin Mfg. Co.

The Doman-Marks Engine Co., Amesbury, Mass., organized by E. S. Marks, former chief engineer of Franklin, and Carl T. Doman, former research engineer of Franklin, is being moved to Syracuse and will manufacture in the Franklin plant.

Although 1936 models have not yet been formally introduced, to engineering departments they already are last year's cars. These departments, especially of the larger manufacturers, are well along with experimental work which is likely to mature for 1937, and in this connection there is increasing talk of air-conditioning.

Air-Conditioned Chrysler?

The past week a rumor has been current that Chrysler might do something in the way of air-conditioning in one of its 1936 lines. Chrysler, it will be recalled, has done considerable experimental work through its Airtemp subsidiary.

Ford recently announced the air-conditioning of parts of the Rouge plant. For that matter, there is not a big automobile manufacturer or a body builder who has not been doing some exploratory work, but a general wave of air-conditioned cars seems more distant than 1936.

In transportation, the railroads and the Pullman Co. have led the procession. The past summer some important installations have been made on buses, especially in the West and Southwest, and there are indications that in 1936 some of the leading eastern bus lines will feature air-conditioned transportation.

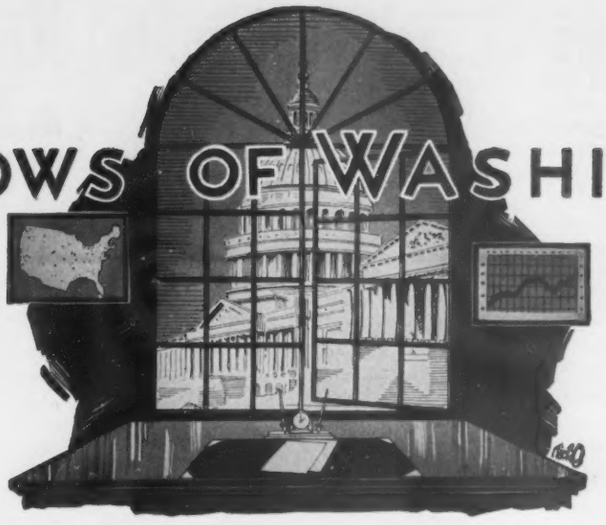
This is a harbinger that private passenger cars are nearing this stage of their development, although one of the large body builders in Detroit maintains that air-conditioned residences must precede air-conditioned automobiles.

In the case of buses, ducts are installed in the ceilings and also in the bottom of the baggage racks, the latter permitting conditioned air to be blown on passengers through registers. Because of frequent opening of doors no attempt is made to seal buses, but even so it has been found possible to maintain temperatures 7 to 10 degrees below the outside.

In private passenger automobiles

(*Please turn to Page* 88)

WINDOWS OF WASHINGTON



WASHINGTON

GENERALLY speaking, labor has been off page one for a number of weeks, but with the Wagner labor relations bill finally enacted and congress back to the hustings, it is becoming big news again. Indeed, Secretary of Labor Perkins herself got back into the newspapers the other day.

First, organized labor seems determined to force the issue whether the Wagner act is constitutional. Charlton Ogburn, counsel for the A. F. of L., who was lawyer for the Amalgamated Association when it tangled with the steel industry last year, has filed complaints against Wheeling Steel, Chevrolet, Fisher Body, and Bendix.

This strategy apparently will leave the steel and automobile industries no alternative but contest the constitutionality of the law. They probably would have anyway, but organized labor wants no delay; it wants a decision before congress adjourns next spring. On the eve of a presidential campaign neither major political party wants to be put down as opposing the "inalienable" right of labor.

Limitations Are Emphasized

Still on the subject of the Wagner act, the first public pronouncement of the chairman of the new national labor relations board—J. Warren Madden—was to alibi for it. While labor leaders and the senator from New York who sponsored it have been referring to it as labor's magna charta, Mr. Madden warned of his board's limitations.

Under the Supreme Court decision in the NRA case, the Wagner act is planted on the commerce clause of the constitution, Mr. Madden warned in a Labor Day address. The board's powers therefore are expressly limited to the prevention of unfair practices affecting commerce.

In every case, labor must prove that alleged hostility of employers to permitting their plants to be organized by the A. F. of L. interferes with interstate commerce. The board unquestionably is trying to forestall the disappointment of local labor leaders who expect it to pull all their chestnuts out of the fire.

But the contest between employers and the A. F. of L. may be nothing compared with the internal battle that is brewing in the federation, and is likely to break out into the open at the Atlantic City convention next month. The issue is the old craft type of union, dear to the heart of the late Samuel Gompers and carried on by William Green, present president, and the vertical or industrial type of which the United Mine Workers and John L. Lewis are typical.

Real Fight in Prospect

An open flare may follow the action of the federation's executive council on the right of the United Automobile Workers to set up a vast vertical union embracing all the employes of the automobile industry.

It will be recalled that when General Johnson, in the early, lush days of NRA, came out for the industrial union John Lewis strung along with him and vastly recruited the strength of his organization. At the height of its recent prosperity the Lewis organization was reported collecting dues of $1 per month from 300,000 miners.

Last May, in the executive council of the federation, Mr. Lewis and his vertical union followers were beaten. If the issue reaches the floor of the Atlantic City convention in October, the result may be different. It looks to many within the federation that only a vertical union can crack the steel, automobile and other mass production industries.

Mr. Green cannot rely upon the government to take sides in this battle, as the right of self-organization guaranteed by the Wagner act presumably excludes both the department of labor and the national labor relations board as well as employers from interference.

The federation is already crippled by a schism among the building trades unions which constitute the federation's greatest strength and form the bulwark of craft unionism. A continued breach in the building trades consequently will weaken Mr. Green's defenses against the onslaught of industrial union factions for supremacy.

FLORIDA CANAL POLITICAL, BUT USES STEEL, EQUIPMENT

Construction of the cross-Florida ship canal at a total cost of $150,000,000 is the biggest engineering job to be undertaken since the Panama canal.

The initial allotment of $5,000,000 announced last week will provide only for preliminary work and commencing excavation in the central area, where the elevation rises to approximately 100 feet above sea-level.

The route selected by way of the St. Johns, Oklawaha and Withlacoochee rivers, connecting the Atlantic ocean with the Gulf of Mexico, is at sea level, eliminating the necessity for locks.

Excavation will be double that of the Panama Canal, which cost $237,000,000, but engineering problems are simpler. Eventually, the canal will be spanned by five highway bridges with a clearance of 135 feet and five railroad lift bridges, but completion of the project is not in sight.

Construction of a canal across the Florida peninsula has been agitated since the time of the Spanish occupation. There is no question concerning its engineering feasibility, but its present economic advantages do not offset its cost. The army corps of engineers estimates that the canal

will pay for itself in 80 years if interest on investment is not included.

The canal will cut from one to two and one half days off the route for ocean-going vessels and protect them from hurricanes, such as last week's, which blow them on the coral reefs off the southern tip of Florida.

New Orleans and other Gulf ports are expected to benefit from an increased volume of export and coastwise trade originating in the Mississippi valley and Southwest.

Like Passamaquoddy and other projects which President Roosevelt has approved on his own motion, the reason for undertaking the Florida canal at this time is political.

Senator Fletcher has stood steadfastly for the administration's banking bill and other legislation, and the canal is his reward for long and distinguished service.

Preliminary construction work will, of course, employ all able-bodied labor from relief rolls within a practicable distance in the state.

Details of the preliminary work have not yet been worked out, but machinery and steel will benefit. Steam shovels will be used for clearing the right of way, for which $500,000 has been appropriated. Another half million is set up for housing, shops, storehouses and minor structures. Excavation in the central area—again a use for machinery and equipment—will be defrayed by the appropriation of $3,500,000, and $500,000 worth of bridge foundations will require reinforcing bars and cement.

SEES NEW DEAL POLICY ON MINERALS IMPERILING U. S.

Secretary of State Hull's success in inducing the Standard Vacuum Oil Co. to surrender the recent Ethiopian oil lease in order to avert an involvment of the United States in the African danger zone elicits applause from J. Carson Adkerson, president of the American Manganese Producers' association, Washington, who is tireless in battling for the rights of domestic manganese interests.

As a defender of home industry, Mr. Adkerson is a foe to the acquisition of mineral and oil properties and concessions abroad in order that they might be worked with low-price labor and their products imported duty free into the United States. In a statement last week he pointed out that this open-door policy was advocated a decade ago by a committee some of whose members are now mineral policy advisers to the Roosevelt administration.

These advisers, Mr. Adkerson maintains, "are leading the nation into serious consequences both at home and abroad." He quotes from the Congressional Record of Nov. 7, 1929, to support the contention that domestic manganese producers can meet the requirements of the steel industry if the former were adequately protected.

Washington has never been able to get its bearings on this question of manganese. Notwithstanding the duty, steelmakers apparently prefer to obtain their supplies from Russia, India, and South America. In the meanwhile, domestic producers of manganese contend they can develop the needed tonnage if they are given a break. And so the battle rages, and never comes to a decision.

Both the sharp interchange of notes with the soviet government and the possibility of the closing of the Suez canal have been followed with great interest — but differing emotions — by steelmakers and domestic manganese interests.

FHA TELLS HOW TO BORROW FOR MACHINERY AND REPAIRS

A booklet just issued by the federal housing administration outlines in detail the eligibility of equipment and machinery under its modernization credit plan.

General principles which govern FHA eligibility are that the article "should have a unit value sufficient to justify the application of time payments to its purchase." Also, "the article should be of a durable nature with a reasonable expectancy of useful life longer than the term of credit extended for its payment."

Hand and small portable tools are ineligible. The purchase and installation of replacement parts for eligible equipment and machinery is satisfactory. The cost of welding a flywheel may not be made the basis of an insured loan, but the purchase price and installation cost of a new one would be insurable.

Single loans up to $50,000 for equipment for manufacturing for industrial plants or for institutions will be made.

IRON, STEEL, MACHINERY LOOK UP ALL OVER THE WORLD

Secretary of Commerce Roper may not have great success in guiding the President by means of his planning council and he may not have made a deep impression on congress, but he has maintained for business a steady flow of foreign trade information.

Greatly abbreviated, the following are some world developments in iron, steel, and machinery reported recently by divisions of the department of commerce or commercial attaches abroad.

Export trade of the United States with South America in iron and steel products was only 92,229 gross tons in the first half of 1935, a decrease of 33.3 per cent from a year ago. Matching the decline in railroad buying in the United States, South American demand for rails went off 88 per cent. Also paralleling a condition in the United States, demand for seamless casing and oil-line pipe receded 53.5 per cent. Tin plate, barbed wire, and steel bars also receded sharply, more than neutralizing gains in galvanized wire, black and galvanized sheets, plain wire, and fabricated shapes.

On the other hand, American exporters have chiseled into the Turkish market, where German producers have dominated. Incidentally, the Russians have also undercut the German quotations, but their irregular deliveries have stifled any volume. In a recent month the Turks took in 500 boxes of American tin plate and 100 tons of reinforcing bars — not big business as American trade goes, but fair for Turkey.

This year Germany has registered a substantial gain in its export trade in tools, shipments abroad in the first four months being valued at 14,485,000 reich marks ($5,794,000), an increase of 16 per cent over the corresponding period of 1934. Employment in the German tool manufacturing industry continues spotty.

Plan Strip Mill in England

The Welsh tin plate industry is upset over the possible migration of its largest producing company — Richard Thomas & Co. Ltd. — to Redbourne, Lincolnshire, where it plans to put $5,000,000 into a modern strip mill, utilizing American practice. Capacity of the plant would be 150,000 tons of sheets and tin plate, produced at a saving of approximately $1,000,000 a year over the present setup. The reason the Welsh are excited about it: The company employs 4000 persons and consumes 400,000 tons of Welsh coal annually.

From Czechoslovakia comes word of appreciable improvement in its iron and steel industry. Production of pig iron in the first half year was 375,000 metric tons, compared with 291,000 a year ago. Ingot output was 564,000 tons, against 478,000 in the first half of 1934.

Australia's leading iron and steel producer — the Broken Hill Proprietary Co., Newcastle, New South Wales — is breaking records. In the year ended May 31 it turned out 507,291 tons of pig iron and 516,738 tons of ingots. Exports also have broadened.

TRUSCON TO TEST SASH?

It is reorted that PWA is going to make some tests shortly of steel and wooden sash. While the date for the tests has not yet been determined, nor the place, it has been suggested that they may be made at the laboratories of the Truscon Steel Co., Youngstown, O.

Industrial Men in the Day's News

George H. Ralls, President, Pressure Castings Inc.,

His business career has been marked by associations in railroad, construction and manufacturing fields.

For 11 years he was active with an automotive parts manufacturer, later going with Chrysler parts division.

In his new position he directs operations of a new company engaged in the manufacture of die castings.

GEORGE H. RALLS, who as announced in STEEL earlier this year is president of Pressure Castings Inc., Cleveland, formerly was director of sales of the parts division of Chrysler Corp. The Cleveland company manufactures a variety of die castings.

Prior to his association with Chrysler, he was president of the Gabriel Co., having been active with this interest over a period of 11 years.

Born and educated in Cleveland, for a time he was aligned with railroad work, after which he joined the Reaugh Construction Co. in that city. Seven years later he became assistant general manager.

He then was associated with the American Column & Lumber Co., St. Albans, Vt., subsequently returning to Cleveland with Nicola, Stone & Myers Co., where he remained for seven years. He then transferred to the Gabriel Co., during the period when it expanded rapidly in the manufacture of shock absorbers and other automotive equipment.

He is a member of the Cleveland Athletic, Detroit Athletic, Shaker Heights Country and Detroit Golf clubs.

♦ ♦ ♦

C. J. Boyd, formerly of the Brooklyn, N. Y., sales organization of Steel & Tubes Inc., Cleveland, has been named manager of a new sales district, with headquarters in Philadelphia, which will cover North and South Carolina, Virginia, Maryland, Delaware, southern New Jersey, and southeastern Pennsylvania. Part of the new district formerly was included in the New York territory and part in the Birmingham, Ala., district.

J. F. Keeler, formerly of the Steel & Tubes sales promotion department in Cleveland, has been transferred to similar work in the Brooklyn office.

I. H. Anderson, formerly of the Philadelphia office, has been transferred to the Brooklyn office, and J. S. Anderson, formerly of the Detroit office, has been transferred to the new Philadelphia office.

J. D. Benfield and Robert Turrell, formerly with the electrical division of Steel & Tubes, have formed their own organization, Turrell & Benfield Inc., Detroit, and are representing Electrunite steel tubes and Fretz-Moon conduit products in Michigan.

♦ ♦ ♦

W. O. Fritze, assistant treasurer of the Keystone Steel & Wire Co., Peoria, Ill., has been elected a director, succeeding W. C. Buchanan, resigned. Prior to last May, the latter was president and general manager of the company.

William C. Erkert also has been elected a director to succeed Hiram E. Todd, whose term has expired.

♦ ♦ ♦

T. I. Phillips, works manager of the Nuttall plant of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and associated with Westinghouse since 1915, has been named general works manager of the company, to serve as central authority for all manufacturing operations. Prior to going with Westinghouse, he was associated at different times with General Electric Co., United Shoe Machinery Co., Mergenthaler Linotype Co. and National Cash Register Co.

♦ ♦ ♦

S. P. Goodloe has been appointed sales representative for the Union Spring & Mfg. Co., New Kensington, Pa., his headquarters to be at 1003 Mutual building, Richmond, Va.

♦ ♦ ♦

R. A. Free, Chicago, was elected president of the National Association of Power Engineers at its fifty-third annual convention held in Pittsburgh recently.

W. H. Wilds, New York, was elected vice president; Fred W. Raven, Chicago, re-elected to his thirty-fourth term as secretary, and E. J. Burke, Philadelphia, treasurer.

♦ ♦ ♦

Nelson J. Darling, manager of the River works of General Electric Co., Lynn, Mass., is now manager of both the River and West Lynn, Mass., works, following the retirement of F. P. Cox, manager of the latter plant. Mr. Cox has been associated with G-E for 45 years.

N. M. DuChemin, formerly superintendent of the West Lynn works, has been appointed assistant manager in charge of operations.

♦ ♦ ♦

John W. Carpenter, for 16 years district sales manager in the Cleveland territory for Otis Steel Co., Cleveland, has been appointed assistant manager of sales, sheet and strip division, Republic Steel Corp., Youngstown, O., effective Sept. 1. A graduate of Princeton university, he served as first lieutenant in the army during the World war and entered the steel industry immediately afterward.

♦ ♦ ♦

William Steytler has been appointed manager of sales of steel and wire products for Pittsburgh Steel Co., Pittsburgh, succeeding Hubert F. Hanks, whose death was noted in STEEL Aug. 26. Mr. Steytler has been connected with Pittsburgh Steel for 22 years, and comes from the company's Detroit office, where he has been district sales manager.

Walter D. Schlundt succeeds Mr. Steytler as district sales manager of the company's Detroit office. Mr. Schlundt has been with the company for the past six years, and has recently represented it in the Detroit territory.

Died:

ROBERT A. FRANKS, 78 for years closely aligned with Carnegie Steel Co. interests and formerly financial secretary to the late Andrew Carnegie, in West Orange, N. J., Sept. 1. He was treasurer and vice chairman of the board of trustees of the Carnegie Corp. of New York, an institution endowed for the advancement of knowledge among people of this country and Great Britain. Born in England, he became acquainted with Mr. Carnegie when only 19, and came to this country with him. Mr. Franks also was treasurer and a director of the United States Steel Corp. and Carnegie Steel pension fund.

♦ ♦ ♦

Charles R. Pratt, 75, consulting engineer and designer of the first electric elevator, in Montclair, N. J., Sept. 3. During the World war he served as mechanical superintendent of the Crocker-Wheeler Electric Co., Newark, N. J., and more recently was associated with the Watson Elevator Co., New York. He retired four years ago.

♦ ♦ ♦

Windsor Morris, 64, president of the Morris Machine Works, Baldwinsville, N. Y., centrifugal pump manufacturer at his summer home on Fourth Lake, Fulton Chain, N. Y.

♦ ♦ ♦

W. Russell Miller, general superintendent of the Hamilton, Ont., plant of the Sawyer-Massey Co., manufacturer of farm implements, in Hamilton recently.

♦ ♦ ♦

Herman W. Mitchell, 51, purchasing agent of Revere Copper & Brass Inc., in Rome, N. Y., Aug. 21. In 1918 he became purchasing agent for Rome Mfg. Co., later merged with Revere.

♦ ♦ ♦

Ernest Melaun, 75, a distinguished wrought metal worker and craftsman, in Indianapolis, recently. He was an honorary member of the National Art Society of America and had designed and executed many notable pieces of wrought iron. Born in Austria, he studied designing in Germany and France and Italy, coming to this country in 1882.

♦ ♦ ♦

Joseph S. Ruble, 57, project manager for federal slum clearance and rehousing in Cleveland, and former construction engineer for the United States Steel Corp., in Crescent Springs, Ont., Sept. 4. A graduate of Penn State college, he was a former officer of the Austin Co., and a partner in H. K. Ferguson Co., both of Cleveland. With the latter company he was identified with the building of a large electrical project in Japan.

♦ ♦ ♦

Arthur H. Apfel, 70, former vice president in charge of operations for the American Can Co., New York, in Chicago, Sept. 3. He founded the Illinois Can Co., Chicago, in 1890, which company in 1901 was merged with several others to become the American Can Co. He retired in 1907 and returned to Chicago where he founded the Birtman Electric Co., being president and chairman until his retirement from active business in 1920.

Diamond Anniversary of Founding Is Observed by Lyon, Conklin & Co. Inc.

LYON, CONKLIN & CO. INC., Baltimore, steel warehouse, is celebrating its seventy-fifth anniversary.

The company was founded in 1860 by William Lattimer Lyon, and since his death has been conducted by his sons, Edgar Lyon as president and Robert W. Lyon as treasurer.

The main plant and warehouse in Baltimore is a sectional steel structure 230 x 430 feet, covered with Lyonore metal, a corrosion-resisting metal invented by the company and used widely where resistance to weather conditions is necessary.

The office building is four stories, of steel, concrete and brick. Offices occupy the second and third floors and the fourth is devoted to an assembly hall and restaurant, with space for the blueprint room. An uptown office is also operated, at Fallsway and Hillen streets, to handle city orders.

In 1913 a three-story concrete and brick warehouse and branch office building was erected at 930 E street N. W., Washington, to care for increasing demand for steel products in that area.

This company has devised a number of machines closely allied to its sheet metal business. In the early '80s it introduced a seaming machine for hammering together in rolls sheet metal for roofing and later developed a snip for cutting scrolls or circles from sheet metal.

In 1913 it introduced an alloy sheet metal, Lyonore metal, resistant to corrosion. In 1922 it added chromium to this alloy, increasing its resistant properties.

An achievement is development of electrical testing equipment to prove the fire-resisting qualities and lightning-safety of metal roofs, thus aiding in their introduction more widely for farm buildings.

Baltimore plant of Lyon, Conklin & Co. Inc.

Activities of Steel Users and Makers

HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J., has taken exclusive distribution of the Bausch & Lomb electroplaters' microscope. The instrument, which magnifies to such an extent that a plate 1/100 of an inch thick appears to be 4 inches thick, consists of a monocular microscope stand (H type) equipped with both coarse and fine adjustments, and achromatic objective, a filar micrometer eyepiece, a vertical illuminating unit for lighting the specimen, and a mechanical stage to facilitate locating the specimen in the field of the optical system.

♦ ♦ ♦

Timken Roller Bearing Co., Canton, O., has received an order from the Pennsylvania railroad for bearings and boxes to equip the engine trucks and trailer trucks of eight of its existing class K-4-s passenger locomotives. Installation will be made at the Pennsylvania's Altoona shops.

Timken has also received an order from the Baldwin Locomotive Works, Philadelphia, for bearings and boxes to equip all axles of a scale test car which it will build

(*Please turn to Page* 88)

EDITORIAL

Recognize the Limitations of Your Own Products!

ONE of the strangest phenomena of industrial management is the blind tenacity with which many executives cling to a pet idea long after most of their contemporaries have discarded it in favor of something better.

The record of the metalworking industries is replete with cases of companies which met disaster principally because their managers were so strongly influenced by misguided loyalty to outmoded tradition or by fanatical prejudice against meritorious innovations that they could not or would not adopt the necessary changes in policy which would have won success.

A typical example of this trait was furnished several years ago by a large builder of industrial machinery. The dominant figure in the company was its president, who had worked up through the engineering side of the business. As the inventor of many of the outstanding engineering features of the company's machines, he naturally was exceedingly proud of their excellent record of performance.

At about this time a number of important changes in the generation and transmission of power were introduced into this branch of the machinery industry. At first, all of the builders were skeptical, but as certain advantages of the new developments became apparent, some of them discarded their old units for the new. Within a few years the new equipment had been accepted generally as standard for the industry.

Pride in Own Inventions Blinds Executive To Advantages of Other Developments

Unfortunately, however, the pride of the engineer-president in his own brain children blinded him to the merits of the new devices. Instead of adopting the improvements, as had his competitors, he acquired a bitter prejudice against them. He had faith in his own creations, and his misguided loyalty to them prevented him from making the changes which would have retained leadership for his machines. Gradually their popularity declined, his business melted slowly away and his company failed.

The foregoing true story has had its counterparts in every branch of industry and in every period of industrial history. Even today, when optimists like to think that executives of the present generation have broken away from the bonds of tradition, it is true that management in far too many instances still is ruled by inhibitions.

For instance, think of the large number of manufacturers who will fight an encroaching material, product or method to the last ditch when, as a matter of ordinary, good business judgment, it would be better to accept the competitive item on its merits and to work with instead of against it.

How many manufacturers, who still are opposing welding at every turn, would be in a much more favorable position to serve their customers profitably if they adopted welding as a complement to their present operations? How many, who now move heaven and earth to make sure that rolled steel, for instance, is specified exclusively on a given job, would be better off if they worked for a suitable assembly of rolled steel with castings, forgings or perhaps nonferrous metals?

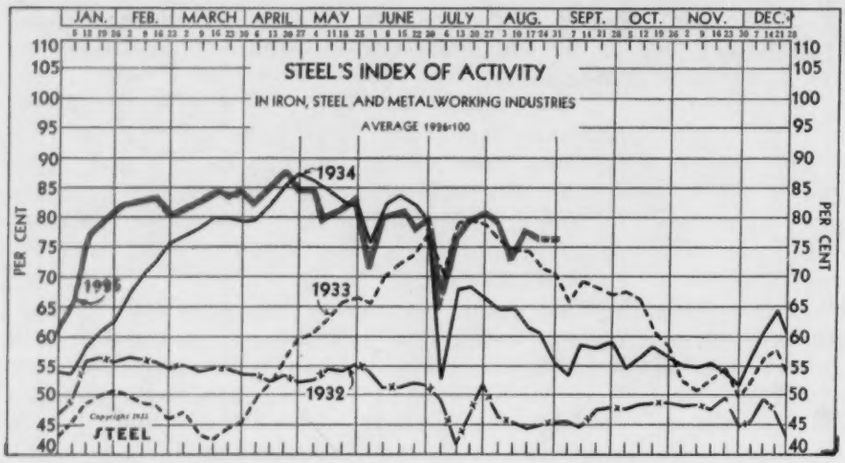
Knowing When to Stop Fighting a Sure Thing Is Important Point in Good Management

The problem resolves itself into a question of what is best for the customer. If a manufacturer has a product which serves a given purpose satisfactorily, by all means he should push it for all it is worth. He does not need to give quarter to any competing product. However, his product may not be able to hold its dominant position indefinitely. Technological advances inevitably will create changing conditions. Sooner or later, his product will be challenged by others. When this situation arises, the manufacturer who is wise enough to appraise the competing products impartially and is open-minded enough to recognize the limitations, if any, of his own product has a decided advantage over the manufacturer who is so blinded by prejudice or sentiment that he fails to see its shortcomings.

A few steel foundrymen have hit upon a plan which seems to solve this problem admirably. They witnessed the encroachment of welded rolled steel assemblies upon the field of steel castings. They knew that for certain parts, their castings were superior to the welded product, yet they recognized the fact that on some parts the welded assembly held the advantage. Instead of yielding the market to welded rolled steel, they procured good welding advice and facilities and proceeded to develop a business in which they utilize castings, rolled steel and welding in the proportion which best serves the customer.

This is a formula which many manufacturers can adopt advantageously.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries remains unchanged at* 77.0 *in the week ending August* 31:

Week ending	1935	1934	1933	1932
June 29	78.4	79.4	77.0	49.2
July 6	64.1	52.3	71.4	41.7
July 13	76.5	67.8	79.1	46.7
July 20	79.8	68.1	79.4	51.5
July 27	80.8	66.4	78.8	46.1
Aug. 3	78.4	64.6	75.9	45.1
Aug. 10	73.4	64.6	74.7	44.6
Aug. 17	77.5	61.4	74.2	44.9
Aug. 24	77.0†	60.3	71.6	45.2
Aug. 31	77.0*	55.1	70.3	45.4

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

Business Holds Brisk Pace as Freight Car Loadings Mount

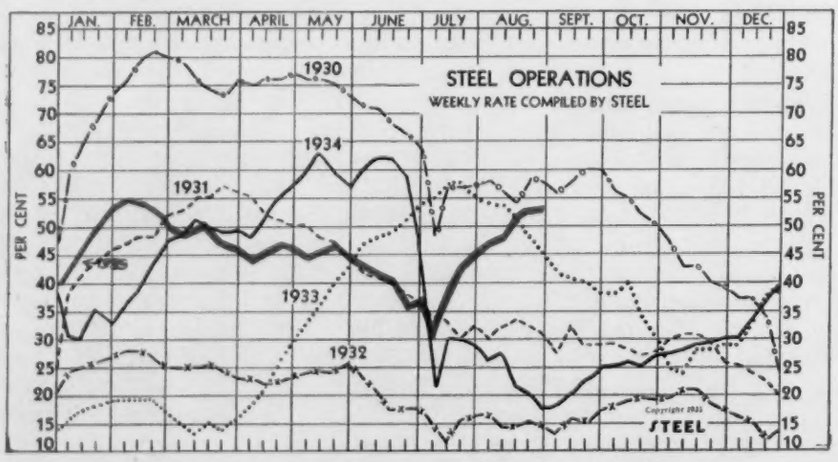
WITH Labor day in the background, industry faces a period of nearly four months that is uninterrupted by major holidays. The activity during this time will go a long way toward determining whether or not the widely expressed expectation of a strong upward swing into recovery in the remainder of 1935 and in 1936 is justified.

The immediate prospect is promising. Steelworks operations in the week which included Labor day continue safely above the 50 per cent mark and in several important producing centers the trend still is upward. While buying of steel for automobiles is in prospect, actual output of motor cars will continue at modest figures for several weeks. The shift from old to new models will be in process throughout most of September and it is doubtful whether a sharp step-up in assemblies can be expected much before Oct. 1.

Freight traffic, which has paralleled that of 1934 almost continuously since the first of the present year, gained sharply in the final weeks of August. From reports of the leading carriers, the total car loadings for the week ending Aug. 31 is estimated at 668,300 cars. If this estimate is confirmed by the official figures, the loadings for that week will be the highest reported for any week since Nov. 14, 1931. The nearest approach since the low point of the depression was in the week ending Sept. 2, 1933, when loadings numbered 667,000 cars.

Electric power output continues above the 1,800,000,000 kilowatt-hour level and it is almost certain that new highs will be scored repeatedly in the final weeks of 1935.

STEEL's index of activity in the metalworking industries remains unchanged at 77.0 for the last week of August.



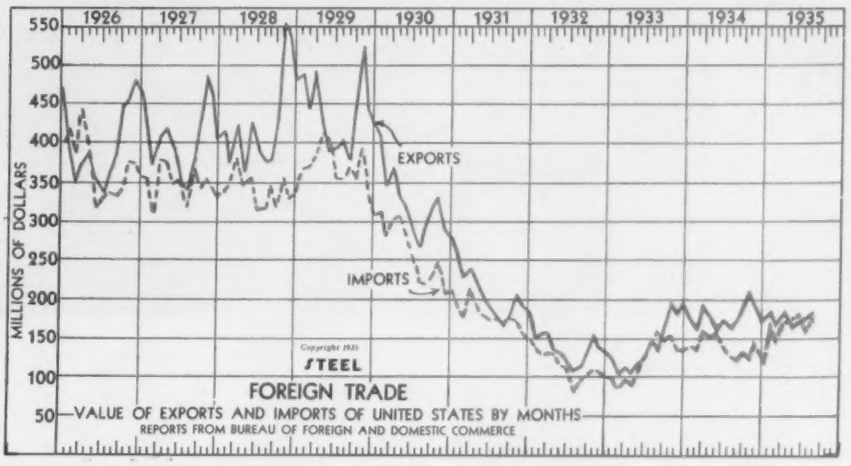
1935 Per Cent	
Aug. 31	52.5
Aug. 24	52.5
Aug. 17	51
Aug. 10	48
Aug. 3	47
July 27	45
July 20	43
July 13	38
July 6	31
June 29	37
June 22	35.5
June 15	39

1934 Per Cent	
Sept. 1	18.5
Aug. 25	20.5
Aug. 18	21.5
Aug. 11	27.5
Aug. 4	26.5
July 28	29.5
July 21	30
July 14	30
July 7	22
June 30	46
June 23	59
June 16	62

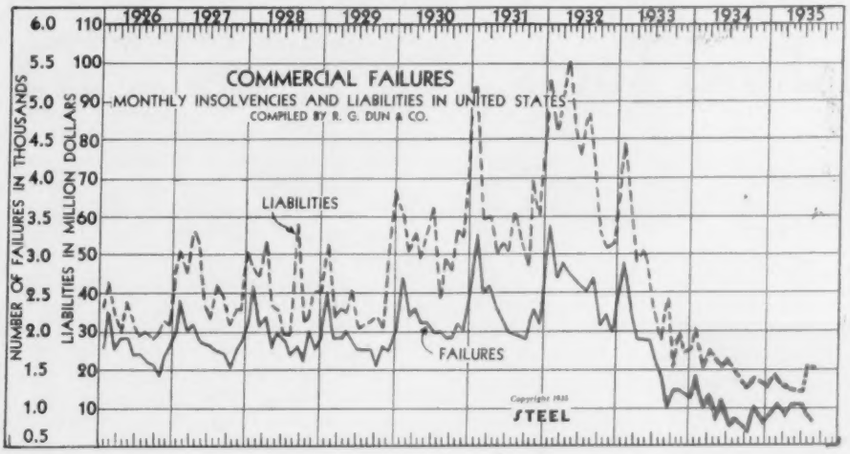
Higher Imports Cause Adverse Trade Balance

Dollars (000 omitted)

	1935		1934	
	Exports	Imports	Exports	Imports
Jan.	176,223	166,993	169,531	128,536
Feb.	163,006	152,537	159,671	125,292
March	185,603	177,279	190,000	158,000
April	164,350	170,567	179,427	146,523
May	165,457	170,207	160,207	154,647
June	170.193	156,756	167,957	135,048
July	173,371	177,698	161,787	127,342
Aug.	.....	.....	171,965	119,516
Sept.	.....	.....	191,690	131,659
Oct.	.....	.....	203,622	137,859
Nov.	.....	.....	194,909	150,919
Dec.	.....	.....	170,676	132,252



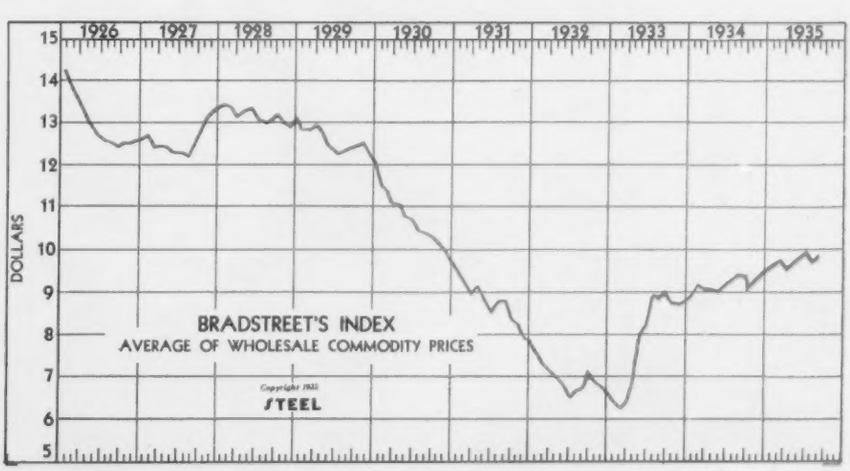
July Business Failures Improve; Liabilities Down

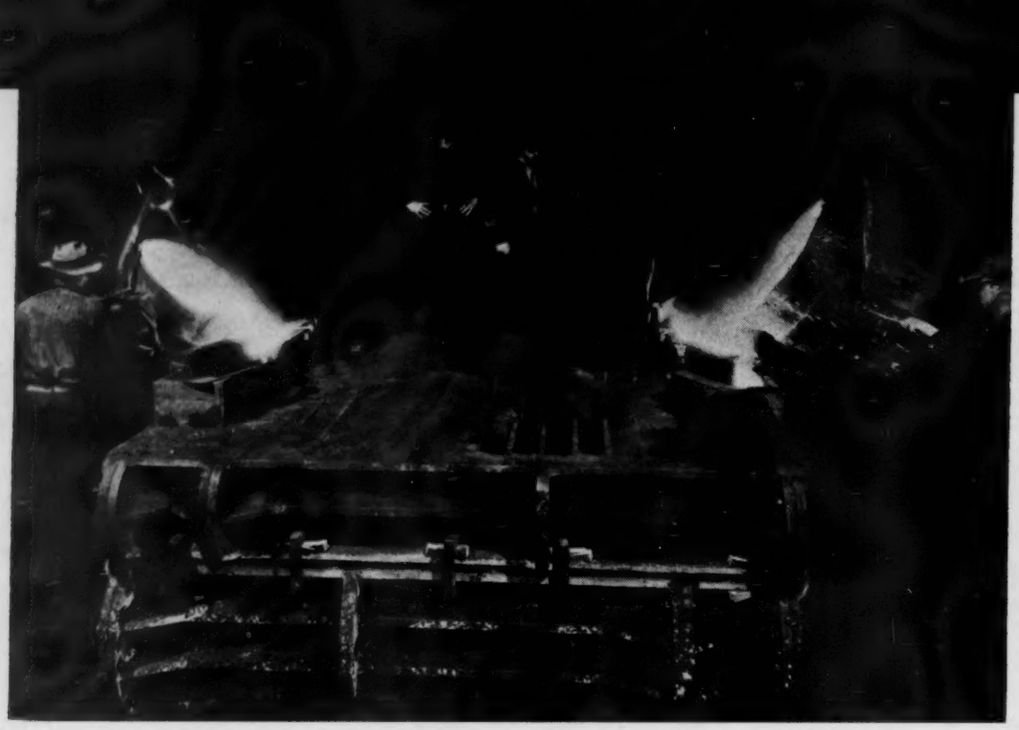


	Failures		Liabilities	
	1935	1934	1935	1934
Jan.	1,184	1,364	$18,823,697	$32,905,428
Feb.	1,005	1,049	18,737,657	19,444,718
Mar.	976	1,102	18,522,840	25,786,975
Apr.	1,115	1,052	18,063,923	25,786,975
May	1,027	977	15,669,627	22,560,835
June	961	1,033	20,463,097	23,868,293
Juy	931	912	20,446,761	19,325,517
Aug.	.....	929	.....	18,459,903
Sept.	.....	790	.....	16,440,147
Oct.	.....	1,091	.....	19,968,448
Nov.	.....	923	.....	18,349,791
Dec.	.....	963	.....	19,910,610

Bradstreet's Index Points Upward on August 1

	1935	1934
January 1	$9.49	$9.01
February 1	9.78	9.26
March 1	9.79	9.17
April 1	9.66	9.16
May 1	9.79	9.14
June 1	9.90	9.24
July 1	9.84	9.32
August 1	9.91	9.48
September 1	.....	9.45
October 1	.....	9.27
November 1	.....	9.29
December 1	.....	9.49





Pouring high-test nickel iron for a large lathe bed casting from two ladles. Precautions are taken to avoid slag and dirt entering the mold

Production of High-Grade Castings for Machine Tools

BY D. M. GURNEY
Metallurgist, Warner & Swasey Co., Cleveland

ALL large machine tool castings are rough ground on surfaces which are not to be machined, given a ground coat of paint, smoothed with filler and painted according to specifications

OBTAINING castings of sufficient quality and accuracy is an ever present problem of manufacturers of machine tools. To be capable of maximum performance, machine tools require a degree of finish and accuracy demanded by few industrial products. The Warner & Swasey Co., Cleveland, machine tool manufacturer, many years ago realized that excellent castings are a prerequisite to the manufacture of good machine tools. Its experience in this respect may be of interest to other manufacturers.

The Warner & Swasey Co. always has bought its gray iron castings from outside foundries. Its early experience doubtless has paralleled that of other purchasers whose requirements, although amounting at times to several hundred tons a month, are hardly large enough to warrant a foundry of its own. Usually there was a discrepancy between what the purchaser wanted and what the foundrymen said could be produced—at any price. The result was a disheartening number of rejected castings, replaced by the foundry, but on which hours of direct labor had been expended before a hidden defect was discovered.

Skill and Ingenuity Used

Some types of castings were more susceptible to defects than others. Frequent conferences of designers, pattern makers, and foundrymen had worked out ideas whereby the percentage of scrap was held to a moderate figure, but a few castings seemed to resist all efforts. In these, where as high as 80 per cent rejects would be encountered, the designers had to devise a construction in which the common defect could be localized or repaired in such a way that it would not cause subsequent trouble.

One such casting, a thick-walled turret, eventually was turned over to

a small foundry in Wellington, O., specializing in machinery castings, whose representative was willing to try the "toughest piece in the shop." The first shipment of these proved to be entirely sound and free from internal porosity usually found in the thick turret walls. The explanation, tnat it was done mainly by building a chill into the core so that the solidification rate was controlled, indicated that the general superintendent was using ingenuity and skill to much better effect than his competitors.

From this first contact, the Sterling Foundry Co., Wellington, O., was given an increasing share of the business. The fact that in over a year's time the per cent of rejected castings is 0.52 per cent of all receipts (about one in 200) is sufficient warrant to describe foundry operations at that plant.

Trains Efficient Personnel

Samuel Hummel, who was superintendent of the foundry at the time it began to make castings for Warner and Swasey, was a man of wide experience in foundry work. He believed that the average molder is spoiled for the highest grade of work because he is not furnished enough of the best materials and equipment, and that his supervisors have constantly driven him for production rather than quality. Consequently, Hummel early turned to the white residents in Wellington, a small agricultural center near Oberlin, and the villages within a 10-mile radius. He was able to recruit a sufficient number of farm-bred young men, intelligent Americans, and trained them thoroughly, each for his own job. These men are the type who take pride in owning their homes. Practically all of them have kitchen gardens and small orchards and are reasonably independent of fluctuations in the business cycle. Some of them operate sizable farms. This requires more aggressiveness and far more stability than is possessed by the ordinary "pay-day" worker.

PROPER control of analysis demands, among other things, careful proportioning of materials before charging into the cupola. Steel rails replace a large proportion of the usual pig iron in the charge

It was not an easy matter to train a hundred of these men. It was a long, tedious job, but the results have warranted the trouble. Each one now is a specialist in his own department, but with the idea of team work always in mind, believing that if he does his part well the final casting will be perfect. Piece rates never have been established, since they favor haste rather than craftsmanship. Dignity and mutual respect characterize the relations of management and workmen in this small foundry.

It would not be easy to over-emphasize this phase of the operation. The human factor is paramount in foundry work where production is too diverse for a high degree of mechanization and standardization. In this particular plant the human element fortunately has been controlled by an able foundryman and executive who is also a born teacher of his craft. The happy result is that "labor turn-over" is no problem at all.

Shortly after contracting for the Warner and Swasey work, Mr. Hummel took his entire force, down to the youngest apprentice, into Cleveland for a thorough inspection of the main factory and a series of talks by various executives, so that they could get first-hand information on what was expected of their iron cast-

Lathe bed castings have close tolerances as to size, contour and surface blemish. They must be free from hard spots and imperfections

ings. Since then, departmental foremen frequently have interchanged visits to keep this idea alive.

High grade pattern making is, of course, essential. This is taken care of at the Warner and Swasey plant in Cleveland. The foundry expects to get accurate patterns, and then makes every effort to keep them in the best possible condition.

A high grade pattern is only the first item of equipment and materials desired for a quality casting. Five different grades of sand are obtained from as many proven sources of supply, bought in carload lots according to specifications adapted from the A. F. A. committee's work on grain size, permeability, clay content, and freedom from organic matter. Similar rigid specifications control purchases of sea coal, plumbago, core oil, and Tux flour. Core or molding sand is mixed in ½-cubic yard batches in a small muller, according to one of ten regular formulas as required for a standardized job, or to special formula as set upon occasion by the superintendent.

Castings Are Painted

Long ago the company learned that far more productive labor was lost by an insufficient supply of flasks, sand, gaggers, nails, or chaplets than could possibly be saved by lower investment in supplies. Consequently an ample supply of everything necessary for the job is readily available to coremaker and molder. This, together with an orderly layout, promotes the idea of cleanliness. For instance, even the cleaning room in the Sterling foundry is a model. It is a light, airy, well-ventilated room, with ample floor space around each operation, a concrete floor, well swept, windows washed and an atmosphere clear enough so that the painting department can put on the final touches in one side of the building, not even separated by a partition.

All large machine tool castings are rough ground on surfaces that are not to be machined, given a ground coat of paint, smoothed with filler, and painted according to specification. This is done for two reasons. First it is better to paint a casting before it is soaked with oil in the machine shop, and second, the whole foundry takes pride in the sleek condition of the castings on the shipping platform. Lastly, everyone who handles these parts, clear up to the erection aisle, treats them with more respect.

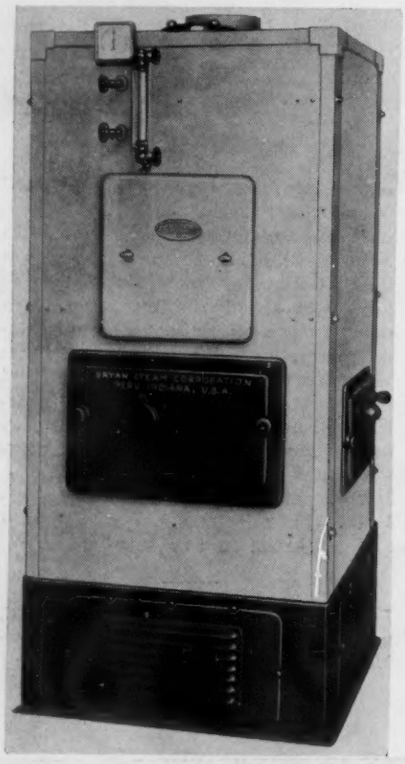
Good foundry equipment extends to flasks. Aside from the light ones used in the bench room, all flasks for floor work and jolt machines are home made, of sturdy section. Only a few sizes are on hand, it being better to use some extra sand on an oversize flask than to stock and find exactly the right size. All flasks (drags, cheeks and copes) of a given size are surfaced top and bottom and pin-holes drilled from templet, to be completely interchangeable. Braces in all copes are removable, being wedged into appropriate niches cast in the inner wall of the flask.

Probably the ultimate quality in cast iron is achieved in a lathe bed. It may be a large casting, weighing up to 6000 pounds and varying considerably in thickness. It has close tolerance as to size, contour, and surface blemish. It must be free from hard spots, hard enough to wear excellently in the massive ways and yet be easily machinable in the thin sections around the gear box. The machined finish must be free of the slightest imperfections and the casting must contain no large internal stress. It must be stiff enough to maintain accurate alignment despite rough handling, uneven foundation, and age. Furthermore, it must be free of harmonic vibrations of periods within the operating spindle speeds.

Certainly all these requirements are difficult to insure in a casting of a single metal. However, these specifications have been met with a high test nickel iron, cast in what is in effect a core mold.

As in all good foundry practice, the greatest care and foresight have been expended in the design of the mold and cores, their proper support, reinforcement, venting and gating, to insure that metal can enter fully into all cavities with the minimum of scour, and at the correct temperature so it will solidify without the defect of sponginess if too hot, or gas cavities if too cool. Furthermore, traces of loose sand or dirt in the empty mold cannot be tolerated. Slag and dirt from the ladle and poring basin are excluded by perforated sheets of "skimmer tin" covering the gate opening. Gates on all sizable castings are also made of hard baked cores to prevent scour. They are so shaped as to give the hot metal a swirling or centrifugal motion, thus holding particles of lighter slag and dirt at the center and top of an eddy, and the clean metal enters the mold cavity through a slot at the bottom of this feeding gate.

Cuts Fuel Bill



AN IMPROVED HOUSE HEATING BOILER, specially designed for automatic coal stoker firing, has been brought out by the Bryan Steam Corp., Peru, Ind. An average unit weighs 2000 pounds of which 200 accounts for rolled steel. Boiler is of cast iron. Base is of ¼-inch steel plate while just inside top is a riveted angle ring on which the boiler rests. Outer jacket, corner angles, top inner lining, smoke pipe collar and cleanout door are of No. 19 gage steel sheets of rust resisting type. Heating element contains several hundred feet of ¾-inch, No. 16 gage, pure copper tubing. The combustion chamber is water jacketed. The company claims the new boiler pays for itself in three to five years due to fuel saving. Expressly designed for coal, it may be adapted for using oil or gas

High Test Cast Iron Used

An up-to-date foundry today would classify its production about as follows:

Type of Iron	Range of Tensile Strength (Lbs. per sq. in.)
Common cast iron	Under 30,000
High grade cast iron	30,000 to 38,000
High test cast iron	38,000 to 50,000
High strength cast iron	Over 50,000

Warner and Swasey lathe beds are made of high test cast iron, as shown in the foregoing classification.

Since gray iron is fundamentally a steel structure or matrix broken up by graphite flakes, its strength is affected by (*a*) amount, size and distribution of the graphite flakes, and (*b*) strength of steel matrix—which depends in turn upon the amount of combined carbon and the alloying elements present. In order to be free of hard spots the combined carbon must be distributed throughout the steely matrix in pearlite, an intimate mixture with soft iron, and not as larger particles of the hard carbide.

In common gray iron the steely matrix, which has of itself a tensile strength on the order of 100,000 pounds per square inch, is badly broken up by relatively large flakes of graphite, occupying 5 to 10 per cent of the total volume. Production of higher strength cast iron in-

volves the reduction of the total carbon, and therefore the *amount* of graphite, and the production of a very large number of very fine flakes. The lower total carbon is effected by replacing a large proportion of high carbon pig iron in the cupola charge with steel (in this case as much as 80 per cent of steel rail is on the charge). The fine granulation of the graphite flakes is had by melting the charge very hot, and by alloying with about 1.5 per cent nickel.

It is obvious that when 20 parts of a selected pig iron is melted with 80 parts of steel rails containing about 0.80 per cent carbon, the mixture must absorb some carbon from the hot coke with which it is melted in order that the metal at the tap hole may contain about 2.80 per cent carbon. On the other hand, contact between molten metal and hot coke in the cupola must be short, else too much carbon will be absorbed. The desired result can only be achieved by close control of the entire operation—careful proportioning of materials, charged in the proper order, melted quickly and removed from the spout almost as soon as melted (that is, tap frequently and hold in large ladles under hot charcoal until cooled for pouring).

Hardness With Machinability

Former practice in melting iron for lathe beds used 50 per cent or less steel in the mixture, and the greatest care was taken to control silicon rather than the microstructure of the iron. Silicon had to be low else the casting would have a porous structure, yet not so low that graphitization was prevented. A prime function of the silicon is to cause excess carbon to form as graphite rather than as carbide; too low silicon would therefore be associated with hard spots where the iron solidified quickly on light sections and corners. Faced with this alternative and the necessity of maintaining machinability, the foundrymen would run the silicon up and risk an open-grained casting. Present melting practice and the addition of nickel produces hardness up to 269 Brinell and at the same time the castings are machinable.

Each lathe bed has a test block attached to it, and serial number and date cast on. Its dimension and placement in the mold are such that its structure represents that of the critical section in the completed casting. It is broken and the fracture studied, and one half sent to the Warner and Swasey plant. It forms a permanent record and material for any desirable special examination, although production has been so standardized that a brinell hardness test is usually all that is made.

When rigidity is a matter of importance, as it usually is in machine tool construction, the use of nickel also improves the stiffness of the iron. Tests by the International Nickel Co. show that Young's modulus of ordinary gray iron is usually between 12,000,000 and 15,000,000 pounds per square inch, whereas high test 1½ per cent nickel iron has a modulus between 18,000,000 and 24,000,000, this being much nearer steel at 30,000,000. Obviously metals with higher modulus deflect or stretch a lesser amount for a given load, and are a factor in maintaining the high accuracy given a machine tool by its maker.

The old proverb that a "chain is no stronger than its weakest link" holds good with respect to castings used in the manufacture of machine tools. Absolute accuracy in a machine tool is obtainable only when all of its component parts are accurate. A machine tool, such as a turret lathe, is essentially a precision instrument and therefore the same degree of attention and carefulness must be given to the making of the castings as is given later in the alignment of the spindle and to the grinding of the gears.

Mirror Finish for Roller Bearings

AN IMPROVED surface finish known as Mirror Finish is being applied to bearings produced by the Timken Roller Bearing Co., Canton, O., as rapidly as the required special machinery can be built and installed. Although the previous standard grind finish on these bearings has been smooth to the delicate eye and finger nail test, the new finish is said to be infinitely smoother.

At the same time the company has set up a method of measuring the flaws in surface finish. This involves the use of a Profilograph developed in 1933 in connection with Timken research at the University of Michigan, Ann Arbor, Mich., and described by Dr. E. J. Abbott, research physicist at that university, before the meeting of the Society of Automotive Engineers held in Detroit that year.

Diamond Point Acts as Tracer

The Profilograph now used at the Timken plant as a gage for measuring surfaces consists essentially of a fine diamond point which acts as a tracer or detector when moving over the surface of the specimen. To this is connected an optical system which magnifies the movement of the detector. In order to record even the most minute irregularities in the finely ground surfaces of Timken bearings it was necessary to apply a vertical magnification of 2000 times to the system. The trace of the detector point as magnified is photographed as a permanent record.

In Fig. 1 are shown the standard grind finish and the new Mirror Finish surfaces magnified 500 times vertically and 30 times horizontally. Under such magnification no flaw in the new finish could be found. Fig. 2 shows the profilograms of the surfaces in their true proportions magnified 1000 times. The company states that the new finish still further improves the operation, precision and friction reducing characteristics of its bearings.

Develops New Products

Several new products have been added to the line of the Dall Mfg. Co., Cleveland. One is a precision device for adjusting piston skirts and stopping piston slap. Another is a piston slot completing machine which also is equipped with a special tool for resizing piston rings.

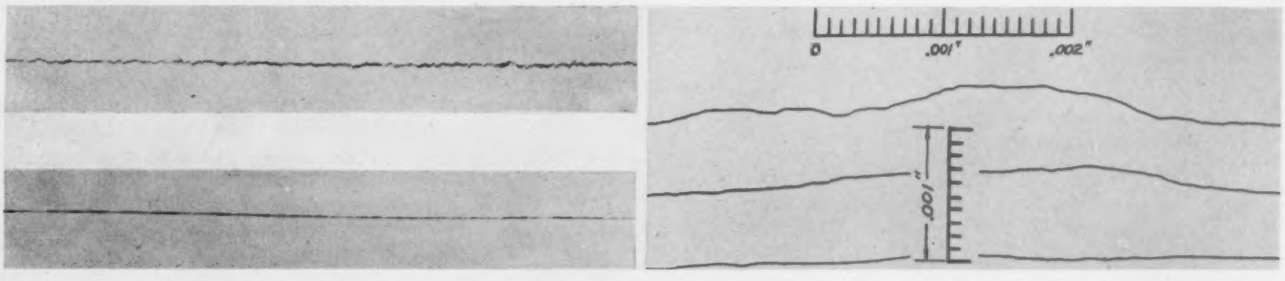


Fig. 1 (left)—shows surfaces magnified 500 times vertically and 30 times horizontally; standard grind finish is shown at top and the new Mirror Finish at bottom. Fig. 2 (right)—shows the surfaces in true proportions under magnification of 1000 which details the bluntness of irregularities. Upper trace shows a rough hone finish, middle trace a single feed mark of a diamond bore and bottom trace the results of finish honing

Fit Product to

TWO views of the forming department are shown in these illustrations. In the foreground above are two large crank presses, while in the background are a number of smaller presses. At the right are shown two brakes for miscellaneous bending operations

BY A. H. ALLEN
Associate Editor, STEEL

CATERING to hot weather demands of the nation's populace has stimulated activities in a number of industries in which fabrication, finishing and assembly of metal products are chief operations. Air conditioning and mechanical refrigeration are two comparatively recent developments in which large amounts of metal assemblies are required; and electric refrigeration is being applied to an increasingly widespread range of products, including such devices as drinking fountains, beverage coolers and the like.

A new type of combination beverage cooler and refrigerator compartment for use in roadside stands, barbecues, soft drink and beer dispensing establishments has been designed and is now in production by the Lima Metal Products Inc., Lima, O. In its fabrication and assembly are involved a number of interesting operations, typical of what the small plant can accomplish by ingenious arrangement and adaptation of equipment.

Various Materials Required

The cabinet, shown in an accompanying illustration, is of all-steel construction and is 46 inches high, 32½ inches wide and 21½ inches front to back. It comprises an exterior surface or wrapper sheet, three front panels, hinged doors on front and top, removable panel over machine compartment, bottle cooler pan in the top and refrigerator compartment in the center.

The wrapper sheet is of 20-gage cold rolled sheet steel, formed on a rail press or brake and notched with universal dies. Front panel strips are spot welded in place as are center and bottom pans. This unit then is finished before final assembly. The refrigerator compartment is of 20-gage vitreous enamel stock. Bottle compartment is of 20-gage galvannealed stock. Inner and outer doors are of the same material, 22-gage.

Between the inner compartments and the exterior is 2 inches of balsam wood insulation, sealed in moisture proof bags. This material is received in bales and fed through a special machine which hogs the fiber to an even texture and feeds it into the bags which are then sealed and the seam coated with asphalt. Insulation on the bottom of the cooler is 3 inches of celotex.

After the various units of the cooler are fabricated and ready for assembly, they are first given the desired finish treatments. Exterior finish of the cabinet is of a special type, commonly known as crinkle or wrinkle finish. It involves application by spray of a mixture of china wood oil, asphaltum and varnish gums, together with the necessary coloring material, followed by baking at 350 degrees Fahr. Hardening of the china wood oil results in a beautiful wavy finish, hard and resistant to corrosive attacks. It cannot be discolored, will not scratch and is impervious to moisture and sunlight. Red and black are standard colors.

Parts Are Baked Continuously

Parts are baked in an 85-foot continuous oven, heated by separately located oil burners, heat being transferred to the oven through ducts. A variable speed chain conveyor travels along the floor of the oven in the center and moves the parts through at whatever speed may be selected. Two of these ovens are operated at the plant, one a prime oven and the other a finishing oven. Parts are loaded on carriers which travel on angle iron tracks. Adjacent to the ovens are located the necessary spray booths, fixtures for holding the parts while being sprayed, and the like.

The ovens are used for applying other lacquer finishes in addition to the wrinkle finish. At the discharge ends are air curtains which effectively seal in the heat.

The beverage cooler is assembled by use of metal screws. Exterior hardware such as hinges and handles is chromium plated. The cabinet sets on four casters and is entirely port-

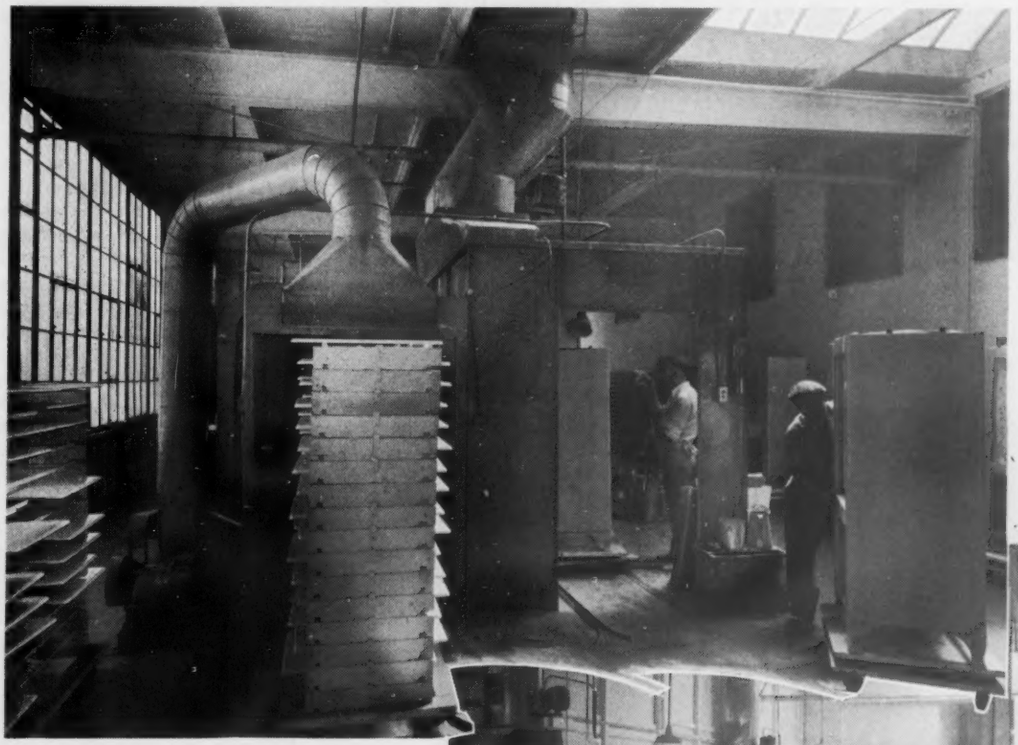
Season, Says Sheet Metal Fabricator

able. The bottle compartment is cooled by 70 feet of 5/16-inch copper tubing connected to the refrigeration unit, the latter being powered by a ¼-horsepower motor. The unit operates in cycles; during a freezing cycle water around the sides of the bottle cooler is frozen and when the power is shut off this ice breaks off and floats in the tank which is kept about half full of water. Cold control mechanism assures proper regulation of the temperature at all times.

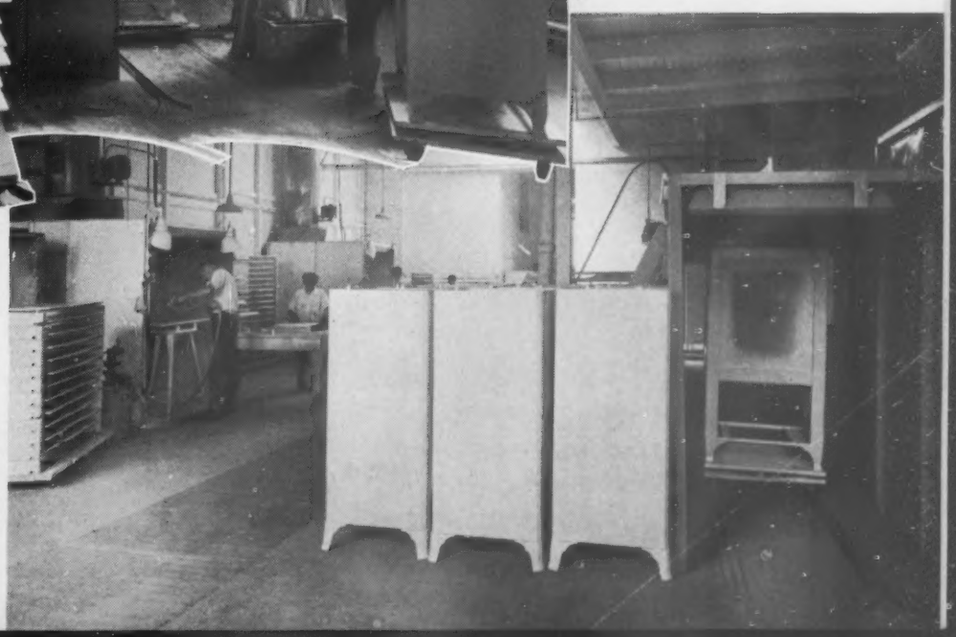
The company is also manufacturing a standard line of domestic mechanical refrigerator cabinets in five sizes—3.5, 4.7, 5.7, 6.7 and 7.6 cubic foot gross capacities. These cabinets are tooled ready for installation of the refrigeration mechanism. Exterior surface is finished in one prime coat and two finish coats of synthetic enamel baked in the previously mentioned prime and finish ovens. Inner compartments are finished in three coats of vitreous enamel.

Another recently developed product is a combination drinking fountain and bottle cooler, somewhat similar to the previously described beverage cooler except that it is smaller and no refrigerator compartment space is provided. A drinking fountain is attached to one side, the water being cooled by refrigeration unit in the base. This unit is entirely of steel, insulated and finished attractively.

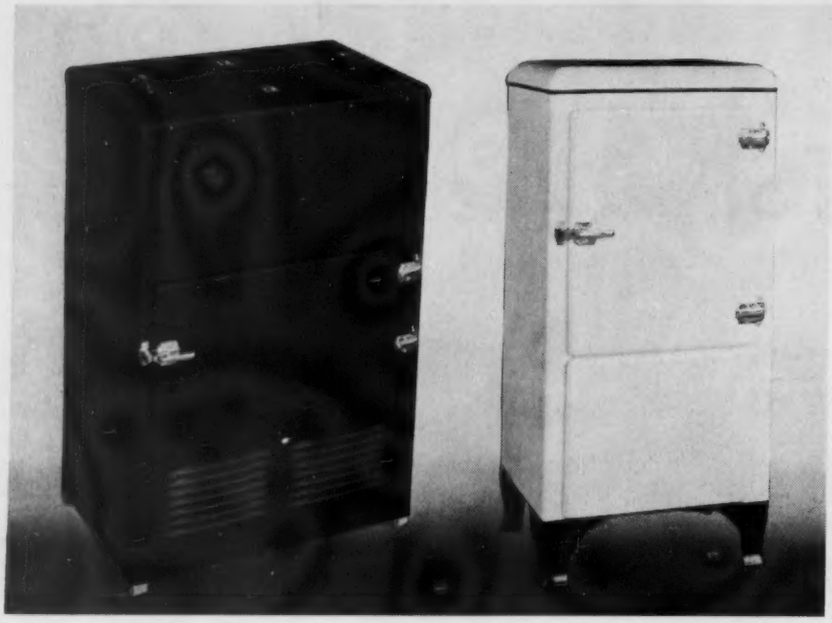
Lima Metal Products Inc. recently purchased land, buildings, and equipment from the receiver of the former Lima Sheet Metal Products Co. and



SPRAY booth and discharge end of one of the baking ovens are shown at the left, with parts on racks emerging from the oven. Note the blower and duct which directs an air stream across the opening, sealing in the heat



AT THE right is a view in the finishing department, with spray booth in the left background and one of the oil-fired baking ovens at the right



Beverage cooler, with baked wrinkle finish, is shown at left. Top contains bottle cooling compartment; center is refrigeration space and bottom is machine compartment. At right is refrigerator cabinet, finished in white synthetic enamel

was incorporated June 18, 1934. New officers took over the company in April of this year and with new capital launched on a program of sheet metal fabrication which in addition to the work already described includes some commercial stamping for manufacturers in the vicinity. Equipment includes presses, brakes, spot and arc welders, lacquering facilities as described, assembly line, tool and maintenance shop, etc. The plant has about 50,000 square feet of floor space.

Universal Dies Permit Flexibility

With such a variety of work to be handled and a fairly limited amount of press equipment, the problem of flexibility is one calling for considerable attention. It would be impracticable to tie up a heavy investment in a large stock of individual dies for each part produced, so a system of universal dies has been developed by H. M. Scarff, factory manager, which permits unusual speed and flexibility in handling different types of forming jobs.

Dies are largely of nickel cast iron or meehanite, with oil hardening tool steel inserts where excessive wear is encountered. Universal piercing dies of all diameters and shapes, mounted on large master plates equipped with tapped holes on 2-inch centers for mounting the punch and die units, are used on all piercing and notching operations. This type of die, being flexible in its application, replaces expensive piercing and blanking dies which, of course, lend themselves only to the application for which they are made. All the special tool expenditure that is required is a template or master.

Adjustable draw dies for shallow draws, such as food compartment outerdoors, are also employed and the only special tool expenditures required when changing from one size panel to another are new rails which are machined in long lengths and simply cut off to the length required when equipped for new size.

Section rails of various shapes and radii are used extensiveiy on the large power brakes for forming corners that require special radii and parts such as refrigerator side panels and legs.

Refractories Meeting Will Interest Steelmakers

Three papers of considerable interest to steel manufacturers are scheduld for presentation at the summer meeting of the refractories division of the American Ceramic society to be held at Pennsylvania State college, State College, Pa., Sept. 20-21. The technical session will be held on the afternoon of Friday, Sept. 20, and will be presided over by J. M. McKinley, vice president, North American Refractories Co., Cleveland.

The main topic for the session will be "Problems and Trends in Refractories Requirements." The three papers bearing on this subject are: "Experiences in the Use of Refractories in the Steel Plant," by Louis A. Smith, refractories engineer, Jones & Laughlin Steel Corp., Woodlawn, Pa.; "Refractory Problems in Basic Alloy Steel Production," by Gilbert Soler, manager of research, Timken Steel & Tube Co., Canton, O., and "A Discussion of the Action of Coal-Ash Slags on Fire Clay Refractories," by Harold E. Simpson, Battelle Memorial institute, Columbus, O.

The session will be held at the Centre Hills country club. Golf and other sports will comprise the program for Saturday, Sept. 21.

Treatise on Wire Drawing Available in English

Steel Wire, by Maurice Bonzel; cloth, 495 pages, 6 x 10; published by Engineers Book Shop, New York; supplied by STEEL, Cleveland, for $15, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Few books in the English language are to be found on the manufacture of wire. The translation of Mr. Bonzel's book on European practice was undertaken in the hope that it would satisfy a long-felt need of those associated with the wiremaking industry in America.

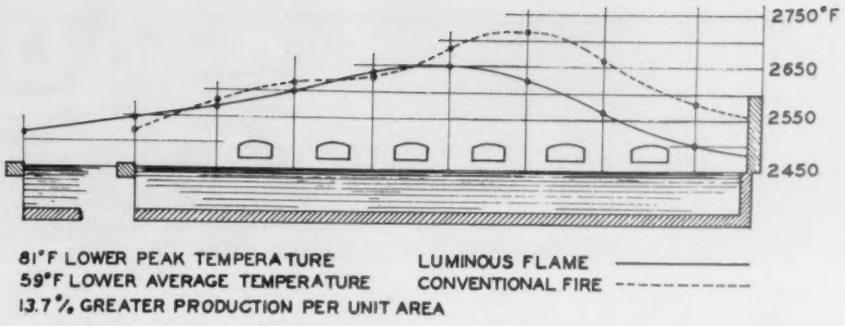
The crux of the 10-chapter treatise is found in Chapters 3 to 6, inclusive. Nearly 50 pages are devoted to the discussion of the fundamentals of the wire drawing die—its nature, shape and life. Then follows the results of a profound study of drawing lubricants. The author dissects the formulas used in the mill and suggests how they may be simplified and logically related to one another.

In the chapter on cold working, the author reviews its principal effects on the physical properties of wire. He considers each property in succession as an index of the capacity of the metal to withstand wire drawing. An entire chapter is devoted to the high ratio of surface to volume which is highly important in studying the problem of corrosion of wire products. Simple protection as in galvanizing and tinning, rust-resisting steels like the copper-bearing steels, and stainless steels which resist chemical agents, are dealt with.

The study of various heat treatments followed in wire drawing practice is developed and is accompanied by numerous graphs, tables, photomicrographs, and illustrations of furnaces and other annealing equipment.

Considerable information of a practical nature is imparted, starting with rod inspection and carrying through cleaning, nature and shape of dies, arrangement of machines, design of furnaces, control of temperatures and atmospheres, etc.; 414 illustrations accompanying the text.

Wire producers, metallurgists, diemakers and others associated with the wiremaking industry in the United States should feel highly indebted to Kenneth B. Lewis, consulting engineer, New York, for making this important work available.



Comparison of a controlled luminous flame fired furnace with a conventional fired unit

Controlled Luminous Flame Affords Uniform Heating

BY J. B. NEALEY
American Gas Association

INDUSTRY'S trend to gas fuel recently has brought to the fore different types of combustion such as the radiant flame, diffusion flame, luminous flame, etc. Now there enters upon the stage what is called the "controlled" luminous flame. Inasmuch as these varied processes of combustion have had their inception for the most part, in the steel industry, it is interesting to note that the latest one has had all of its applications so far in the glass industry.

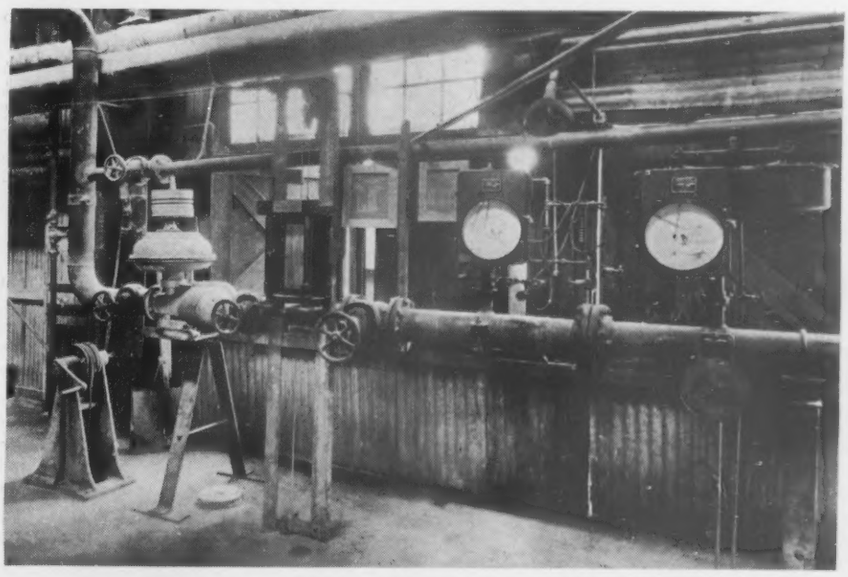
However, it should be of interest to the steel industry as its application here clearly is indicated. In other words, as it is being employed successfully to melt glass there seems to be no reason why it could not just as well be used in open hearths, soaking pits, billet heating furnaces, etc. in steel mills. This presumption is given added weight when one recalls that the luminous flame already is enjoying success in these applications. The controlled luminous flame method of firing offers a help to all operators of furnaces when the quality of the finished product depends on uniform flame coverage. In such furnaces where a uniformity of combustion conditions is desired, this system particularly is useful.

Air and Fuel Metered

To control combustion, the fuel must be introduced to obtain definite results. This requires a metered source of combustion air and fuel gas. In this new method a fan delivers the air through an orifice plate where it is metered and then conducted to the furnace. The gas also is metered and its pressure controlled by a sensitive regulating valve. It then is delivered to the system at 6 ounces total pressure. Distribution of gas is made to the furnace port, or ports, where the supply is controlled by calibrated valves which register flow rather than per cent of opening. The gas then is introduced through the port sides to form a layer underlying the air supply. For proper operation it is evident that the velocities of the gas and air streams should be in relation to one another. It also is evident that the erosion of the refractory materials is operating constantly to interfere with any attempt to fix this relationship definitely.

In order to control and adjust the velocity of the gas stream a velocity controlling mixture consisting of air and waste gas is introduced. This mixture of air and waste products of combustion is blended with the fuel gas in amounts as required at each individual port. With this blending operation it is possible to control the velocity of the fuel gas stream. After the velocities have been adjusted it may be necessary to control the length of the flame. This is done by changing the ratio of air to waste gas in the velocity controlling mixture. The length of the flame is influenced by the diffusion of the fuel gas and overlying air stream. Using all air in the velocity controlling mixture will result in a flame of given length. Substitution of a portion or all of the air with waste gas changes the diffusion rate resulting in a longer flame. It is evident that this control enables all of the fuel to be consumed within the furnace. The uniform flame coverage results in larger furnace output and higher quality.

In all cases 100 degrees Fahr., and in several cases as much as 400 degrees Fahr. lower crown temperatures have been recorded. The flame, as applied in this method, is ideal for use with suspended types of flat caps. The uniformity of flame coverage results in an average lower operating temperature.



Auxiliary equipment used in the controlled luminous flame burner system

Boron for Wear Resistance

In STEEL of Aug. 26, page 34, appeared an article entitled "Wear and Corrosion Resistant Surface Provided by Boron Carbide Crystal." This title was in error because the process mentioned developed by Colmonoy Inc., Los Nietos, Calif., involved the use of metallic boron crystals which do not contain carbon. This error was confined entirely to the title as the article following described the process correctly.

Fig. 1—Finishing end of continuous cold strip mill as equipped with the new gage classifier. Flattening and side trimming unit is shown at the right while toward the left are the crop shear, flying shear, classifier table and stagger piler

CLASSIFIER FOR COLD ROLLED SHEETS SEPARATES ACCURATE FROM OFF GAGES

THERE is a growing demand among the users of tin plate and light gage sheets for material of more uniform gage. This is especially so in sheets that are to be used for deep drawing purposes and tin plate in products such as bottle caps and friction top cans where variations in gage cause considerable trouble. Consumers have also found that by using sheets with only slight variations from standard gage, the life of their forming dies is prolonged, delays in production are reduced and a more uniform product is obtained.

In the production of light gage cold rolled strip from which sheets and tin plate are produced, there occur certain inherent variations in gage of the material throughout the length of the strip. These variations may be caused by deflections in the mill stands, change of contour of the rolls, hard and soft spots in the material, variations in tension, etc., and this is true with strip produced both by tandem and reversing mill methods.

Can Be Used at High Speeds

Of great interest, therefore, is a new classifier put into successful operation and patented by the Jones & Laughlin Steel Corp., Pittsburgh. This classifier will separate sheets produced from cold rolled strip into several different classifications and will hold the tolerance from standard gage within exceedingly small limits; for instance, for a given gage, the classification could be those sheets falling within the specified tolerance from standard gage; another classification could be the sheets slightly below this tolerance; the third classification could be sheets even lighter than the above; the fourth classification could be sheets just slightly heavier than those specified as standard, and the fifth classification could be those that are heavier than classified in the fourth classification. Of course, this dividing of sheets could be carried out in any desired manner of classification.

This new classifier, manufactured and sold by the Aetna--Standard Engineering Co., Youngstown, O., under an exclusive license, can be used at a speed of approximately 400 feet per minute on practically all classes of sheets produced from continuous strip.

How Flying Micrometer Operates

In a typical installation shown in Fig. 1 the strip in lengths of several hundred feet is delivered to the classifying unit on drums from a reversing cold mill. The drums are mounted in a coil box and the strip fed through a machine equipped with flattening rolls and which also trims the strip to width. The trim from both edges comes out in ribbons which are cut by a rotary shear into suitable lengths and dropped into boxes for further disposal.

The strip then passes through a crop shear which squares the front end and then to the pinch rolls and flying shear.

The gage measuring device, as shown in Fig. 3, is a so-called flying micrometer or electrolimit gage mounted ahead of the pinch rolls feeding the flying shear and is set for various gages to carefully made standard test pieces.

Before the sheet is cut to predetermined length by the flying shear, the flying micrometer has determined the variation in gage and into which particular classification the sheet is to be piled subsequently by the classifier table.

Fig. 2 shows a classifying table of the usual multiple belt type equipped with solenoid operated gates for diverting the off gage sheets, and will separate the sheets into three classifications, the heavy going into one pile under the table, the light into a second pile and the O.K. or correct sheets going into a stagger piler at the end of the table.

The flying micrometer is provided with two small rolls between which the strip passes continuously on its way to the flying shear. One of these rolls is fixed whereas the other will move according to the variation from gage of the strip and by means of opposed induction coils and an armature which is suitably attached to the movable roll a slight variation in voltage in the coils is produced and indicated on a micro-ammeter. Attached to the indicating pointer on the micro-ammeter are suitable contactors that make contact with adjustable mercury contactors mounted on the micro-ammeter, through which this slight variation in voltage is transmitted to thyratron tubes mounted on the control panel, and through suitable time delay relays operate the solenoids on the classifying table. These solenoids in turn operate the gates through which the classified sheet is thrown into the correct pile.

Stagger Piler Is Used

Thus, it will be seen that as long as the movement of the roll is confined within narrow limits, the variation in gage is very slight, but after passing a certain limit predetermined by the position of the mercury contactors on the micro-ammeter, sheets will either be thrown into the light or heavy pile.

The stagger piler shown in Fig. 4 will pile any predetermined number of sheets alternately from one side of the pile to the other side of the pile, and makes the sheets easily separated for charging into the normalizing furnace or for other purposes. The staggering is accomplished by guides at the right and left hand

side of the piler. By tilting the left hand guide and leaving the right hand guide vertical, the sheets would be thrown to the right hand side and vice versa. This tilting of the guides is accomplished by a photo-electric cell, or magnetic eye, which is connected to a counting and recording device. This device reveals the total number of sheets passing into the piler. When a predetermined number have passed into the piler, the counting device reverses the position of the guides, thereby forming a stagger pile.

Gaging at Edge Proves Accurate

The gaging of the strip is done near one edge, as it has been found in practice that the variation in gage across the width of the strip is negligible. It can, therefore, safely be said that the gage found along the edge represents the thickness across the width of the sheet, this being especially true of strip produced on modern 4-high cold rolling mills. In practice the variation from standard gage of plus or minus .0005 inch is acceptable by the trade.

In order to have five classifications instead of three it is only necessary to add an additional micro-ammeter, thyratron tube and relays and two additional gates on the classifying table.

From the standpoint of the tin plate maker, considerable advantage is gained in holding as nearly as possible to standard gage which, of course, produces a more uniform weight and eliminates the loss caused by over weight besides enabling him to better satisfy the demands of his customers.

Practical Foundryman on Castings Gates and Risers

Gates and Risers for Castings, by Pat Dwyer, engineering editor *The Foundry;* cloth, 364 pages, 6 x 9 inches; published by the Penton Publishing Co., Cleveland, and supplied by STEEL, Cleveland, for $3.00 plus 15 cents postage, and in Europe by the Penton Publishing Co. Ltd., Caxton House, Westminster, London.

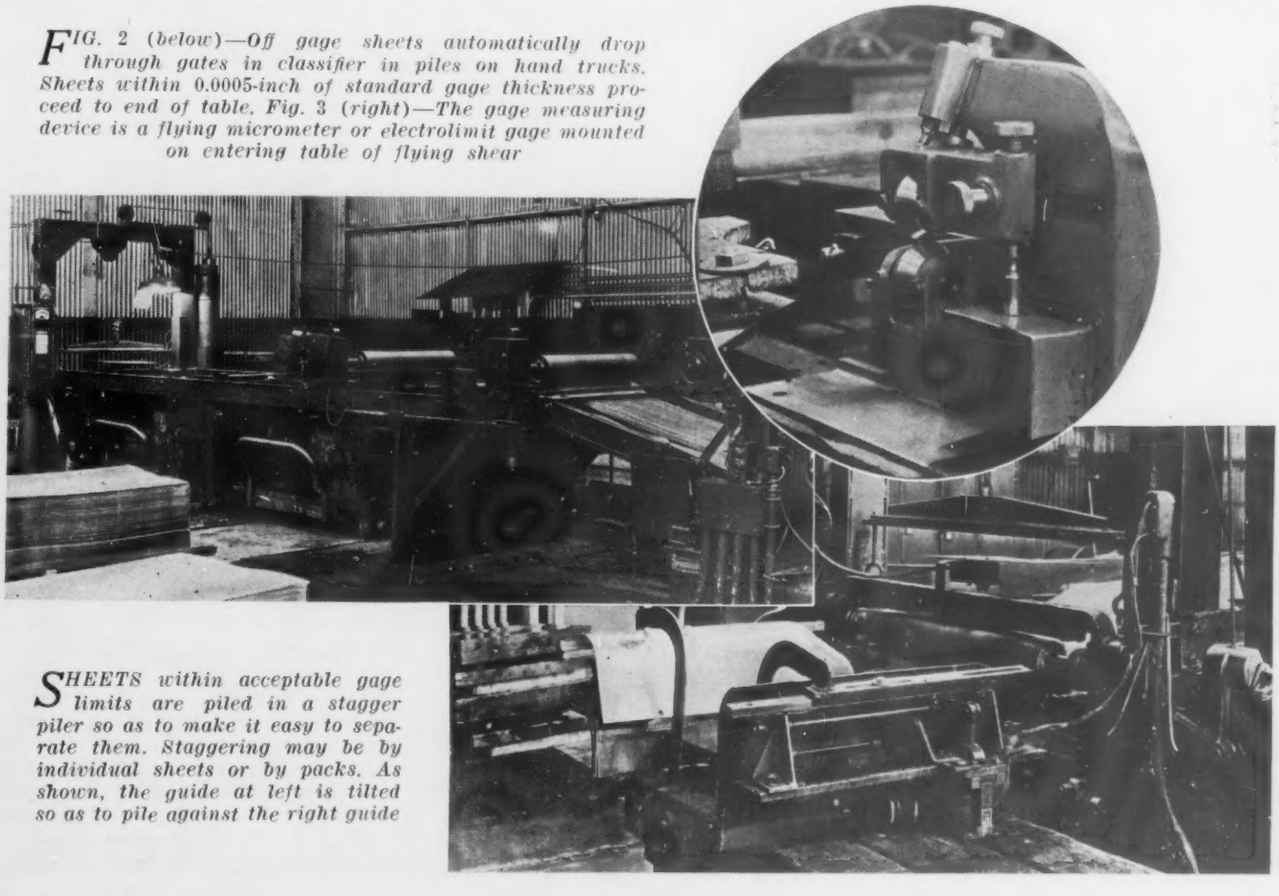
This book covers in a detailed, comprehensive and authoritative manner, practically every phase of one of the most important branches of molding practice. For convenient reference, the subject is divided into five main sections, dealing respectively with gray iron, brass and bronze, aluminum, steel and malleable iron. As a further aid to a reader seeking specific information on any given point, the book is provided with a 14-page index listing nearly 2000 items. The text is supplemented by 243 illustrations of original line drawings showing the function and application of gates and risers in almost infinite variety.

A brief outline of the scope of the work is shown in the following headings for the 27 chapters: Dirty castings, nomenclature, pouring methods, shrinkage, skimmers, pouring basins, cored castings, pencil gates, top gates, warpage, bronze castings, aluminum bronze, temperature, shrinkage, statuary, dross in copper, aluminum temperature, pouring height, aluminum alloys, steel castings, chills, heads, piping, heat gradient, ladles, hidden defects, centrifugal process, steel chains, malleable iron, design, cupola metal, pattern arrangement.

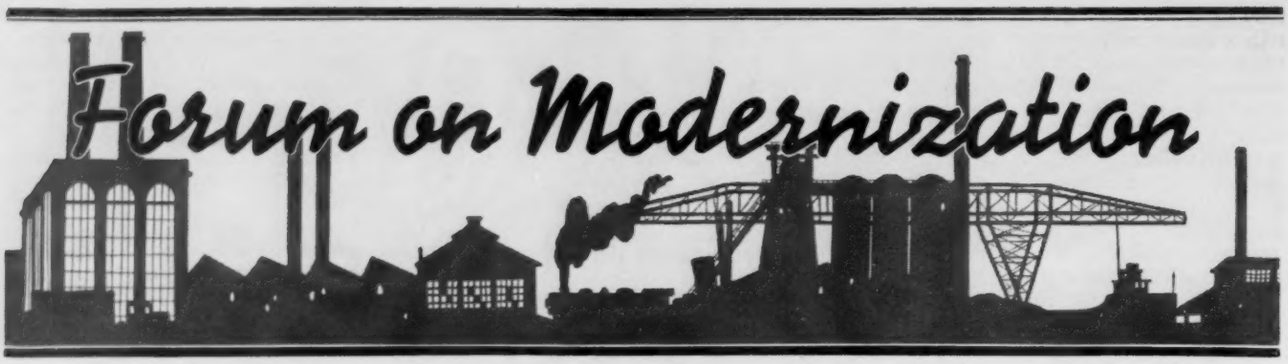
Extent to which the subject of each chapter is elaborated as illustrated for example in Chapter 1 which covers analysis of lost castings, origin of dirt, top and bottom pouring, advisability of risers, every casting rule to itself, pressure needed, slow pouring, cause of dirty castings, strainer cores, gates in cores, cylinder gates, clean basins. The book serves a two-fold purpose: (1) A guide in the proper selection of size and type of gate for any purpose; (2) an answer to the perennial question "Why is a certain casting defective?"

This book, written by a practical molder of exceptionally wide experience, covers the subject intimately from the inside or shop view point and is highly recommended to foundrymen either of limited or wide experience. It will prove a mine of knowledge to apprentices, molders, foremen, patternmakers, metallurgists and others.

FIG. 2 (below)—Off gage sheets automatically drop through gates in classifier in piles on hand trucks. Sheets within 0.0005-inch of standard gage thickness proceed to end of table. Fig. 3 (right)—The gage measuring device is a flying micrometer or electrolimit gage mounted on entering table of flying shear



SHEETS within acceptable gage limits are piled in a stagger piler so as to make it easy to separate them. Staggering may be by individual sheets or by packs. As shown, the guide at left is tilted so as to pile against the right guide



Improvements in Material Handling Equipment Aid Production Efficiency

BY WALTER HARNISCHFEGER
President, Harnischfeger Corp., Milwaukee

WE ARE in an era of change and readjustment. The depression taught people to expect more for their money. They want something new, something better. Because this new philosophy penetrates deeply, it affects practically every industry. In some industries this is more evident than in others—at least on the surface.

This new tempo is probably more apparent in our transportation facilities than elsewhere. New streamlined automobiles make common the mile-a-minute clip, new lightweight trains flash over polished rails, new metal airplanes establish new records to conquer time and space. The world is moving faster, yet the consumer must pay no more.

Crane Has Greater Mobility

Because this is true, many industries find themselves facing a real or imaginary impasse. Conditions are forcing them to change their methods of manufacture, to meet new requirements in design, to cut the costs of production, to sell for less.

Executives are feeling this need for change. Equipment which served well but a few years ago has become obsolete; not necessarily because it is worn out but because there is better equipment, bringing new and better ways of doing things. The first to use them profit most. The rest follow in self-preservation.

The use of the arc welder, for example, which gained impetus as a "hard times" instrument during the depression, has enjoyed phenomenal growth during the past six years. Sales of these cost cutting machines consistently tax production facilities. Welding is being adopted in new fields every day, yet the potential market is not scratched.

By employing all welded construction in the upper deck of a new convertible excavator crane we can mount it on a small truck chassis for greater mobility than has ever been possible before in a unit of this type. In a one-day test run it traveled the distance of 192 miles between Milwaukee and Chicago at an average speed of 21 miles an hour, reached speeds as high as 40 miles an hour with absolute safety, and moved 75 tons of material at the extremely low total fuel cost for truck and crane of only $3.40.

Handling Costs Are Important

Higher speed at lower cost is not limited to the rails and highways. It is just as vital in industrial plants in the form of faster and more efficient handling of materials. It eliminates waste and keeps production machinery at full operating efficiency. It has been well said that "the greatest cost savings of today and tomorrow are likely to come from moving rather than from making."

During the past 50 years in which our organization has specialized in the design and manufacture of materials handling equipment there have, of course, been tremendous advancements. It is not surprising, but interesting to note, that each new idea and device has been evolved to do the job faster, more efficiently and at lower cost to meet the demands of industry. Handling methods have, in fact, been the very life blood of many industries where volume production has made possible the lower selling costs to bring products within reach of the masses.

An interesting and recent example of the way one development paces another is seen in the case of welding. The coated welding rod brought more intense heat with greater liquidity of weld metal and a faster rate of deposition. It also brought new demands upon operators. It meant that welding, to be a practical production process, had to be done continually in a downward position. To accomplish this, many operators were spending as high as 80 per cent of their time turning clumsy pieces to keep them in proper welding position. To do away with this enormous waste of time and labor, we developed welding fixtures both manually and motor-operated to do this for them. Cost studies showed that actual time reductions with some of these fixtures ran as high as 60 per cent—a tremendous saving accomplished by improved handling equipment alone.

Avoid Costly Pitfalls

The veins and arteries of the manufacturing plant are its handling facilities—cranes, hoists and overhead systems of all kinds. The natural evolution of handling starts with the man with a wheelbarrow and develops into the use of these mechanical devices.

The degree of success with which the production superintendent meets in reducing his manufacturing costs and increasing the applications and markets for his company's products is not always in direct ratio with his modernizing efforts. Although it is not at all unusual to find cases where the installation of a new hoist or crane has reduced handling costs as much as 50 per cent—even in plants which were supposedly up-to-date—misapplications often enter into the calculation, particularly so in these rapidly changing days as we emerge from the months and years of comparative inactivity to encounter spasmodic periods of near peak production.

The wise production manager will also be extremely cautious in sensing

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the true trends in his production lines. A sudden turn away from large volumes of depression-born special business can change handling requirements in a surprisingly short span of time.

While it is sometimes possible to adapt obsolete or misapplied handling units, the result frequently is a compromise which does not represent the most efficient installation available. Costly pitfalls may be avoided by allowing adequately for expanding capacity which is certain to seek its level in the channels of the best organized and most intelligent producers.

As has always been maintained, the plant which will continue to lead the way to lower production costs in the heavy industries is that one which has learned to look to material handling methods for a large portion of operating profits.

Speed, Work Quality, Production Time Yardsticks for New Tool Installations

BY AUGUST MARX
Vice President and General Manager,
G. A. Gray Co., Cincinnati

WHETHER it is advisable, from an economic standpoint, to replace old tools with new ones depends on three major factors, each one of which must be given careful consideration.

First—Will the new tool machine work faster than the old one?

Second—Will it produce better work?

Third—Will it reduce set-up time, tool-setting time and idle time?

Practically All New Tools Are Faster

Let us analyze briefly these three considerations. Offhand one would say that practically all modern machine tools will reduce machining time due to the faster cutting speeds now so generally available, as well as to the greater feeds made possible by the increased rigidity of modern tools. Tungsten carbide is bound to play an important part in modern machining, and it can be used to advantage only on machines of the most rigid type where high speeds are available. Sometimes however, the allowable speeds and feeds are determined not by the machine tool, but by the nature of the work itself, in which case the old tool may provide as high a speed and feed as it is feasible to use.

But even when higher speeds and heavier feeds could be used, the operator frequently does not employ them because the speed and feed changing mechanisms are unhandy or cumbersome to operate. For example, to change the feed on the old style planer you have to crouch down and laboriously crank the nut across the friction disk. On a modern planer a mere twist of the wrist gives the exact feed desired. Also compare changing the speed by manipulating the levers of the old geared speed box on top of the housings with the instantaneous speed variation of the present-day reversing motor drive.

Will the new machine tool produce better work? Again the modern tool with its more rigid construction, more scientific distribution of weight, greater inbuilt accuracy, and far smoother helical or herringbone gear train, running in oil, will generally produce far better work. In the case of planers, far too little consideration is usually given to the quality of the product as it comes off the planers. Frequently the thoughts of the production department are concentrated on the machining time only, and do not take into consideration the time wasted on the erecting floor in filing and scraping, which time (usually a considerable item) could have been saved had the parts been planed more accurately.

New Planers Save Time

Will the new machine tool reduce set-up time, tool-setting time and idle time? In the case of planers, most decidedly "yes." Merely mentioning a few of the time saving features of modern planers will serve to indicate that this is the case: Rapid power traverse of all heads in place of slow hand cranking; setting and clamping rail from operator's position instead of walking around the machine; forced feed and centralized lubrication in place of the old time-consuming oilcan method.

In addition to the usual time savings which are common to practically all modern planers, many other features can be furnished for production planer work that greatly increase output, such as quick-latching duplex tables. When a planer is thus equipped, a job is set up on one table while another piece is being machined on the other table. This saves the entire set-up time. Planers are now being built with turret heads as well as other means to reduce tool changing time.

What the New Milling Planer Does

A still later development which will reduce set-up as well as machining time is the milling planer. This new tool, as the name implies, embodies all the desirable characteristics of the most highly developed planer-type milling machine as well as those of the most modern planer. It makes it possible to machine each surface by the most economical method without transfer from one machine to another. Cross slots and similar surfaces are machined with maximum speed and accuracy and without resetting the job. In one setting of the work you can plane or mill, bore or drill. This saving of resetting time is of tremendous importance on large work as the set-up time frequently equals or may even be greater than the actual machining time.

In addition to the strict economic advantages of new equipment, it also has a decided psychological effect on speeding up and bettering production. The increased speed of the machine itself, the quickness of the rapid traverse tends to accelerate the movements of the operator much as a lively musical tempo animates a crowd. An operator also involuntarily takes more care and does better work on a new machine than on an old one of obsolete design in which he takes no pride and which he feels, either justly or unjustly, is no longer accurate.

Twin Cylinder Compressor For Refrigeration Units

Tecumseh Products Co., Tecumseh, Mich., manufacturer of refrigeration and automotive parts, has developed a twin-cylinder compressor to furnish 1 to 1.6 cubic feet of air per minute, depending on speed and size of motor. All of the engineering features of the company's present 1-cylinder compressor have been incorporated in the new model.

The new compressor has been developed to take care of the increasing demand for a quiet, efficient compressor for domestic boxes ranging from 9 to 20 cubic feet and also for installation with show cases, ice cream cabinets and other units requiring a 1/3-horsepower condensing unit.

METHODS AND MATERIALS

Develops Stop-off Lacquer For Chromium Plating

A new stop-off lacquer for use in chromium plating has been developed by the research laboratories of United Chromium Inc., 51 East Forty-second street, New York. Tradenamed "Unichrome Resist," this lacquer is claimed by engineers of the company to possess several ideal properties.

From an electrical standpoint, the lacquer is said to be an excellent insulator, furthermore, it is resistant to the chemical action of the various acids and rinse waters used in the cleaning and plating operations. It flows readily, air dries quickly, and has good adhesive properties. The coating is reasonably tough and ductile.

Applied readily either by brushing, spraying or dipping, the lacquer can be removed easily when necessary by means of a solvent. When in contact with the chromium plating solution, it does not yield products which might contaminate the solution. Another advantage is that it is nontoxic. Previous to announcement, the lacquer has been proved thoroughly in actual plating service in a large number of plants.

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X-Ray Machine Examines Work on Production Line

Through use of a newly-developed X-ray apparatus, manufacturers can now "see through" their products on the production line to detect flaws in the metal, flaws in welds, or stray pieces of foreign materials. As products pass through the machine on a conveyor belt, the operator looks through an eyepiece to get an interior view of each unit. Any unit which does not come up to requirements can be marked for rejection by means of a pointer device.

This is said to be the first time it has been possible to make an X-ray inspection fluoroscopically of goods in motion on the production line. The machine also has a radiograph attachment for making X-ray photographs, in case these are desired of any specific product. Fluoroscopic work has been done through ¼-inch of steel plate, and radiographing with 1-inch of steel. Among other uses of the equipment are examination of aluminum castings for flaws in the metal, examination of mica or bakelite for metal objects which might interfere with efficiency of the material as insulation, examination of porcelain for cracks, etc.

Although the equipment has a voltage capacity of 150,000 volts, the unit is said to require only about the same amount of current as is necessary to operate two ordinary flat irons. Special tubes have been constructed and a cooling arrangement devised which permit continuous operation of the machine during many working hours. No technical knowledge is required by the operator, who is in no way exposed to rays of the machine.

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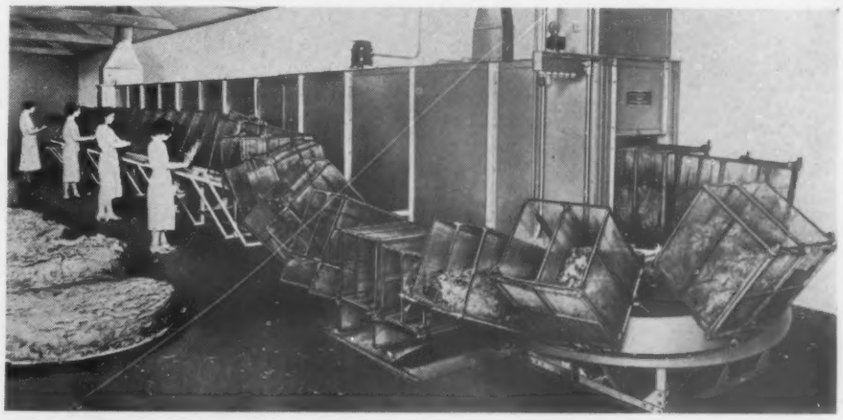
Nickel Wrought Iron Has Better Physical Properties

The effectiveness of nickel in strengthening unheat-treated steel, as exemplified by the use of "as rolled" nickel steel boiler plate for locomotives and nickel steel structural shapes and plates for bridge construction, has led to the recent use of nickel in commercial wrought iron to raise its strength and fatigue resistance. It is

Stainless Cuts Tobacco Spoilage



TOBACCO BLENDING, CONDITIONING AND COOLING EQUPMENT now are fabricated from stainless steel by Proctor & Schwartz Inc., Philadelphia, from stainless steel. The hard, impermeable, mirror-like surfaces of the metal, produced by Allegheny Steel Co., Brackenridge, Pa., easily are kept clean and withstand heat and moisture without discoloration or other deterioration. All interior linings, basket studs and chain joints are of stainless. Cigar, cigarette, pipe and chewing tobacco handled by the new equipment is said to be more wholesome and free from metallic or other taint

the first and at this date the only alloy wrought iron of which industrial use is made. One of the principal uses today is for oil well sucker rods.

$ $ $

New Magnetic Alloy Steel For Sound Transformers

Allegheny Steel Co., Brackenridge, Pa., has obtained exclusive American rights to manufacture and sell a new magnetic alloy steel acquired from undisclosed British interests. This new steel, an alloy of nickel, copper and iron, has high magnetic permeability, and when used in radio, instrument and sound transformers, will produce a more natural tone and greater accuracy than is now obtainable with existing magnetic alloys, according to W. F. Detwiler, executive vice president, Allegheny Steel Co. The alloy is known as Mumetal.

$ $ $

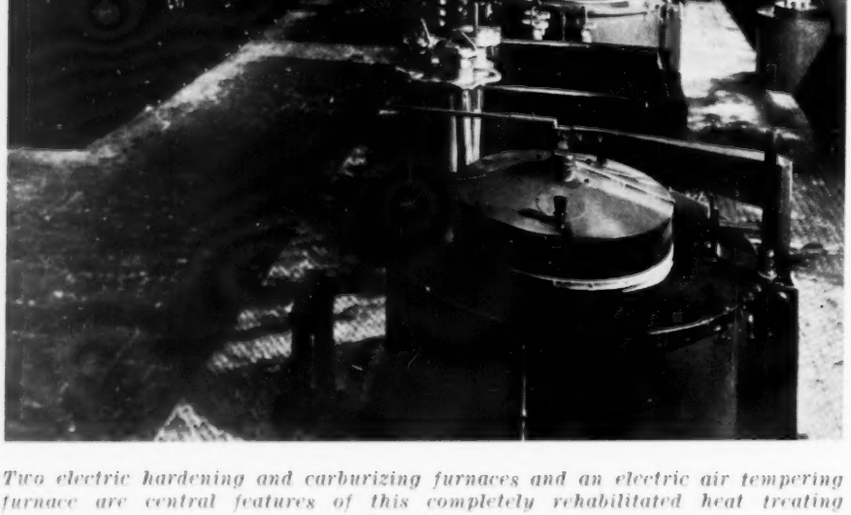
Nails Are Spray Coated

Among new applications for the metal spraying process is that of manufacturing galvanized nails. In Sweden, Germany and Switzerland, it is reported that nails are now being coated with zinc and aluminum in a rotating drum. The work is done in such a manner that 50 pounds are sand blasted and sprayed in 8 minutes. Incidentally, the cost of production by this method is said to be low.

Tool Builder Installs Complete New Heat Treating Facilities

COMPLETE revamping of its heat treating department recently has been completed by the Monarch Machine Tool Co., Sidney, O., with installation of modern heat treating equipment. In general, the new set-up is planned to enable the company to treat for exactly specified metallurgical structures, and to obtain these structures with fewer rejects and less refinishing. Capacity of the new equipment provides amply for future expansion and the present trend of greater usage of heat treated parts in machine tool manufacture.

The heat treating department, shown in the accompanying illustration, is built around a pair of triple-control Hump electric hardening and carburizing furnace and a Homo electric air tempering furnace. In addition to the electric furnace equipment, the department is provided with a small gas forge heating furnace, two box-type auxiliary gas-fired furnaces, an oil quenching tank, an electrically heated wash tank and a water cooling tank. Provision has also been made for the installation of an insulated soaking pit at a later date.



Two electric hardening and carburizing furnaces and an electric air tempering furnace are central features of this completely rehabilitated heat treating department

In laying out the department, considerable thought has been given to the method of mounting the furnaces and arranging the various pieces of equipment. The equipment is located in a separate well-lighted and well-ventillated room, 62 feet by 18 feet, with fuel fired furnaces at one end. The three large electric furnaces, the two electric gas generating units for atmosphere control, together with the oil quenching tank, the washing tank and the water tank are set vertically in a specially constructed pit 7 feet deep, 12 feet wide and 42 feet long.

All the units mounted in the pit are arranged with the tops at the same convenient working level at less than waist height above the floor. Each unit is carried on a structural steel frame which, in turn, is mounted on separate concrete piers, built up to the desired height from the floor of the pit. This arrangement results in convenient maintenance on the equipment. The operator is able to walk completely around each unit to inspect gas lines, thermocouples and over-heat protection fuses, without interference from the supports.

Water Accumulation Prevented

Suitable lighting and drainage facilities also are provided in the pit. In order to guard against water accumulation, a drain is located at the bottom and in the center of the pit which slopes to one end where an automatic pump is located, which functions when the water reaches floor level of the pit. The heat exchanger and oil circulating system for the oil quenching tank also are conveniently mounted in the pit. All electrical wiring is carried in square conduit which is recessed along the vertical pit wall. The pit is easily reached by stairs at one end.

The floor surface surrounding the furnaces and tanks, and covering the pit, is nonskid iron plates on which work can be handled without damage to the floor. The surface of the rest of the floor is wood block. The wood block part is of sufficient size to allow trucking to proceed quietly and conveniently along the line of equipment. All work is handled in and out of the furnaces and quench tanks by a motor driven high and low speed overhead traveling hoist which serves any point in the department.

Furnace covers are operated by foot treadles which project through the floor at a point directly in front of the furnaces, where the operator

can conveniently operate the furnace lids by foot and at the same time operate the controls of the traveling hoist.

All furnace temperature control instruments, automatic control contactors and relays, variable transformers, kilowattmeters, heater switches, signal lights and time clocks are arranged on a control panel. All electrical connections between the furnaces and control panel are carried in conduit underneath the floor. A square conduit carries the main electrical supply line of 220 volts 3 phase to the control board. With the two electrically heated units for generating the gas atmosphere for the hardening and carburizing furnaces located near the opposite wall from the control panel, and with all gas and other pipe lines and electrical conduit carried below the floor level, nothing interferes with the quenching operation. One man operates the complete heat treating department.

In the future, all headstock and tailstock spindles and all spindle sleeves for Monarch lathes will be carburized to uniform hardness of 60 to 63 Rockwell C. Gears, clutches, studs, shafts, rack, pinions and other heat treated parts will be of oil hardening steel S.A.E. 2350, hardened and tempered to specified hardness. Hardness limits and warp limits will be extremely close, even on long shafts and spindles. Efficient use of the Hump furnaces is expected, because they will be switched from carburizing to noncarburizing service, depending on what parts are available for heat treatment.

Steel Bars and Channels Are Cut with Oxyacetylene Flame on New Machine

STERLING WHEELBARROW CO., Milwaukee, has designed and built a special machine for oxy-acetylene cutting of long steel bars and channels. Sections to be cut are laid on a level table which consists of projecting I-beams at intervals of three feet. The cutting torch is carried on a four-wheeled carriage running on parallel rails, one V-shaped and the other flat. Track and table are 50 feet long and cuts of that length can be made.

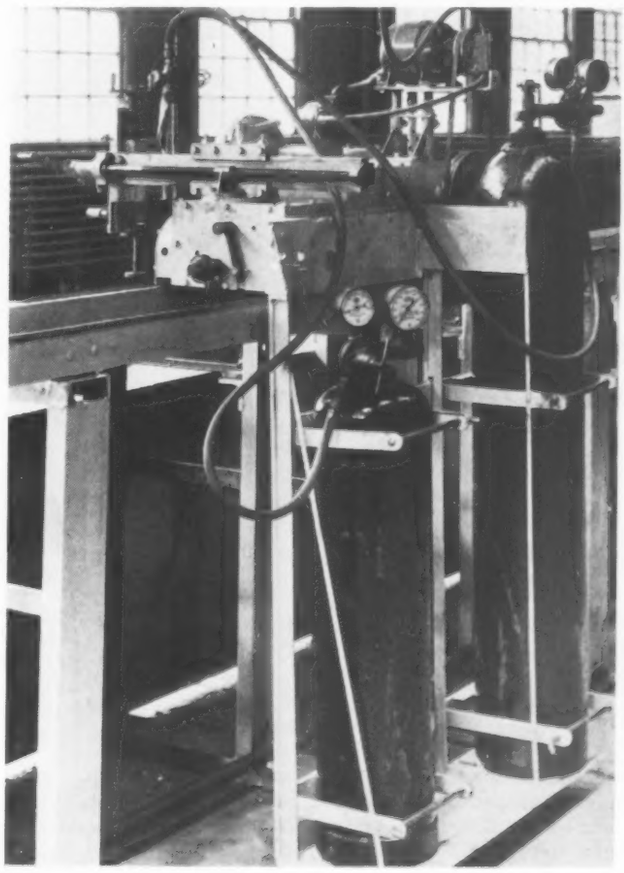
The longitudinal cut is parallel with the edge of the bar or channel and an adjustable roller guide, shown in the accompanying illustration, maintains the torch at a predetermined distance from the edge. The torch has hand feeds both cross and vertical and can be swiveled to cut any desired angle. A motor is mounted on the carriage and reduction is obtained through a V-belt drive and a train of gears. Automatic longitudinal feeds, obtained through the transmission gears, give cutting speeds of 4 to 36 inches per minute.

Gas Tanks on Suspended Platform

A unique feature is that the oxygen and acetylene tanks are placed on a platform suspended from the rear of the carriage. This arrangement prevents the necessity of using long tubes from stationary tanks to the moving carriage. Weight of the tanks and platform is counterbalanced by an adjustable counterweight at the front of the carriage.

The new machine was developed by the company to solve a problem in the fabrication of its line of steel foundry flasks. Since flasks are made in various sizes it formerly was necessary for the company to carry a complete stock of steel channels to accommodate the different flask depths. This situation has been obviated by the use of the new machine. The channel used for this work has depth of 10 inches with web of ¼ or ⅜-inch. In forming a flask 8 inches deep, for example, a section 3½ inches wide is cut from the channel. The remaining 6½-inch section is saved for use in making a larger flask. Two of the 3½-inch sections then are welded together with a 1-inch square bar between them. For larger flasks a heavier reinforcement is used. This bar replaces a specially rolled steel section which embodied the bar.

To form the channel section into a square or rectangular flask, a new horn press is employed. This was designed by the Sterling company and is of the hydraulic type with push-button control. The horn of the press may be moved horizontally out of position to facilitate placing and removal of the work. This is accomplished quickly by throwing a lever which controls a compressed air mechanism. Each stroke of the press produces a right angle bend in the channel, four such bends forming the piece into a square or rectangular shape. The two ends then are welded together.



Rear view of Sterling machine for accurate torch cutting of long steel bars and channels. The adjustable roller guide is shown at left. Oxygen and acetylene tanks are carried on a platform suspended from the traveling carriage

Refractories shaped to provide bottom pouring facilities with ordinary ladles now are available for hand ladles. The refractory box simply is pressed into the mud in the green lining to a depth of ¼-inch, dries there and is held in place until the lining burns out.

A.F.A. Discusses Foundry Costs

CHARTS of cost systems for three divisions of the foundry industry were displayed and discussed at a luncheon meeting of the cost committee of the American Foundrymen's association held Aug. 21, during the association's thirty-ninth annual convention in Toronto, Ont., Aug. 19-23. Sam Tour, vice president, Lucius Pitkin Inc., New York, presided at this session.

Robert E. Belt, secretary, Malleable Iron Research institute, Cleveland, stressed the dissimiliarity in the three charts displayed. In the four branches, he stated, we have the same departmental breakdown of costs. The smallest number exists in the gray iron industry and the greatest number in the malleable iron industry. The latter, he pointed out, is now applying the greater portion of the expense of the cost items on the rate of metal poured because of the low yield.

Henry Halsted, secretary, Gray Iron Founders society, Cleveland, questioned the possibility of arriving at a uniform cost system for the four industries in question, because of certain customs which exist.

At the time the charts were prepared, stated P. E. Rentschler, Hamilton Foundry & Machine Co., Cincinnati, O., the idea merely was to incorporate the general subdivisions, many of the details having been left out in order to avoid complicated charts.

Decision on Fundamentals Is Needed

There already is a similarity in the departmental cost breakdown, stated Mr. Belt, and if the four branches were to decide on a few fundamentals as applied to the costs there would be a tendency toward uniformity. He suggested that the cost committee center its attention on the analysis of the four cost systems aiming toward uniformity and at the same time concentrate on the non-uniform practice, ever keeping in mind the idea of making them uniform.

The committee, stated Sam Tour, does not propose to formulate a uniform cost system for the entire industry. The work of the committee, he emphasized, is to help the trade associations to work up the various cost systems.

The general conclusion following the two-hour discussion was that the cost systems in their present form should be submitted to the respective indutries and recommended for use until such a time as changes became necessary.

WELDING, et cetera . . .

BY ROBERT E. KINKEAD

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Going to Cleveland?

MEN who make machine tools will show their wares in Cleveland Sept. 11-21. If you are tired of the spectacle of the Lion of Judah and the King of Italy praying to the same God for the success of their arms, visit Cleveland and see this show. Here you will see human progress at its best. The tools with which the machinery of civilization is made will be there, and attended by the greatest manufacturing experts in the world.

There are grounds for argument on the question of whether Julius Caesar knew more about government in 55 B.C. than Franklin Roosevelt knows in 1935 A.D. There are no grounds for argument on the question of whether any machine tool made in 1935 is vastly better than one made so recently as 1925. The men of the machine tool industry have bet their lives and their fortunes on the proposition that the general standard of living of all the people is raised by making it possible for each man to produce more. These tools being shown this year increase man-hour productivity to such a large degree as to afford some hope that industry can produce wealth almost as fast as the administration can spend it.

Special features of the machine tools shown this year are: Perfection of control; introduction of automatic features; use of welded steel construction; reduction in capital investment per unit of output.

Sparks and Flashes

The salesman who sells a welding method regards it as a success if it produces the desired result once. Setting up the job to produce the desired result 100 times out of 100 tries with the man who will actually carry out the method is a mere detail to the salesman. Yet, we saw this happen: The salesman sold $4500 worth of equipment for which he received $450 in commission and from which he paid his expenses. The purchaser spent over $15,000 to get the manufacturing methods perfected to the point at which the desired welds were produced every time by the operator. The purchaser was led to believe that because the method would work once it would work every time. But after all, there would be no use for manufacturing experts if manufacturing were as easy as it seems to many salesmen.

* * *

Purchase of welded steel construction places a legal liability on the vendor for good material and workmanship but does not ordinarily involve liabilty for damages incurred if the vendor has failed to furnish good material and workmanship. The vendor must repair or replace defects of material and workmanship. So long as the vendor carries out his responsibility, the purchaser has no further recourse. Since the damages resulting from weld failure usually are many times the amount of the vendor's responsibility, welded construction should be built under rigid specifications.

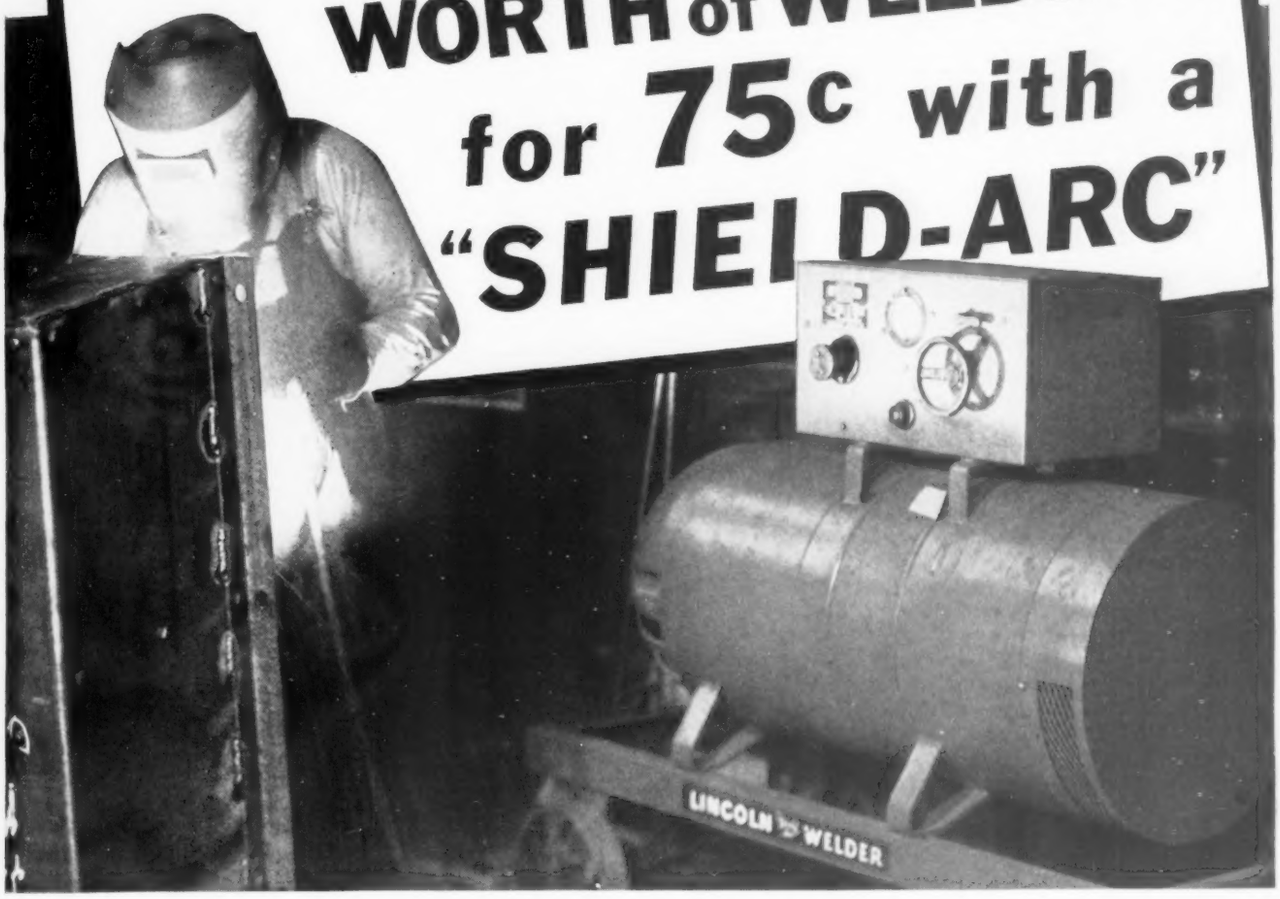
* * *

Soviet engineers are likely to get shot or imprisoned for mistakes or errors of judgement. Visiting engineers from the soviet report their welding is not so good—welds fall apart. Welding would be a bad business for a nervous man to follow in U.S.S.R.

* * *

There are about 250 new arc welding machines being sold per month at the present time. There are not that many new craftsmen being trained in all of the schools of the country. The demand for skilled craftsmen exceeds the supply.

You can get a DOLLAR'S WORTH of WELDING for 75c with a "SHIELD-ARC"



The value of your welding dollar increases up to 25% when you weld with a *"Shield-Arc"!* This remarkable welder gives you more welding for your money because it welds faster, yet with less splattering and waste of electrode metal. More of the metal goes into the weld because of *"Shield-Arc's"* uniform current.

And *"Shield-Arc's"* high capacity lets you save upwards of 30% by using larger electrodes. Often, using just one size larger electrode cuts welding costs 10% to 25%.

Moreover, *"Shield-Arc's"* greater efficiency lets you save on power costs. You get more welding per kilowatt hour.

Think how these savings will mount up! Many users report up to $160 saved per month by scrapping their old-type machines in favor of the *"Shield-Arc."* Find out how much the *"Shield-Arc"* can save you. Ask THE LINCOLN ELECTRIC COMPANY, Dept. Y-161, CLEVELAND, OHIO. Largest Manufacturers of Arc Welding Equipment in the World.

LAD "Haven't you any sympathy for the under dog?"

POP "Say, the under dog isn't looking for sympathy. What he wants is help. Any manufacturer losing out against lower cost production needs the help that *'Shield-Arc'* is guaranteed to give him on cost cutting."

THE LINCOLN ELECTRIC CO., Dept. Y-161, Cleveland, Ohio

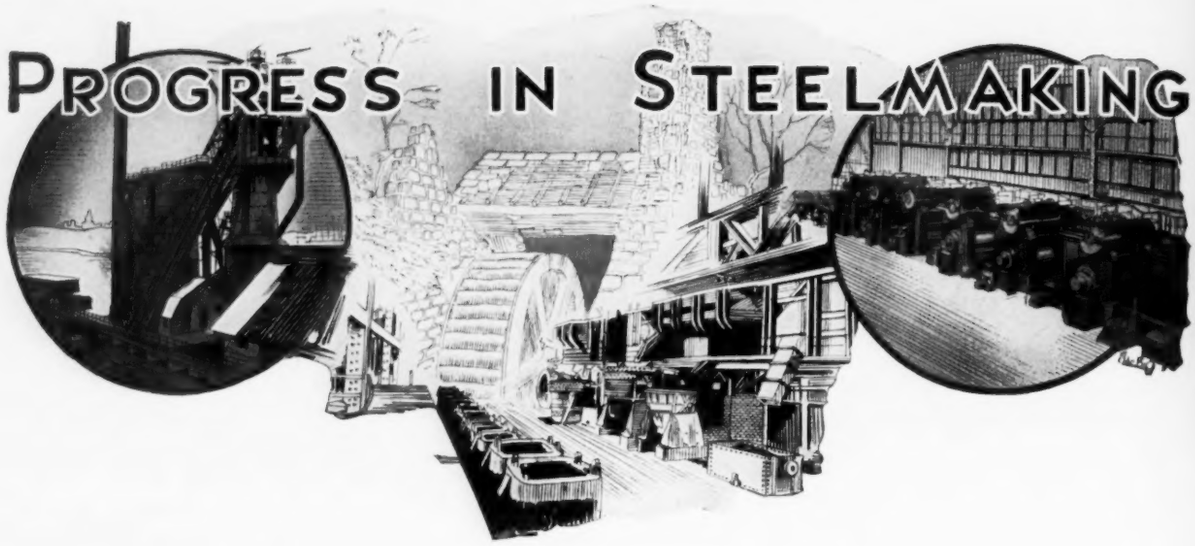
How can I get a dollar's worth of welding for 75c with a *"Shield-Arc"* welder?

Firm .....

Your Name ..... Title .....

Address .....

City ..... State .....



Markets Rustproof Paint

Corrosive resisting qualities are imparted by a rubber and bitumen paint developed for structural steel, filter tanks, underground pipe, etc. On a recent scrub test performed by a rubber manufacturer, the paint withstood more than 180,000 strokes compared with 100 strokes for oil-resin paints and 6000 for bakelites. The product resist dry heat up to 400 degrees Fahr. and sprays more than 700 square feet to the gallon. Zinc, aluminum and lead can be painted successfully without the use of any undercoats or primers. The product is claimed to be 96 per cent moisture-excluding, and is resistant to acids and alkalies.

• • •

Reduces Oil Consumption

An interesting new method for applying oil to cold rolled sheet steel during the rolling process has been devised by one of the prominent manufacturers of compressed air spraying equipment. Advantages offered by the new method are a reduction of at least 50 per cent in oil consumption under the old method of flowing the oil on with a pet-cock and a better sheet due to the ability of the spraying equipment to apply the oil to both sides of the strip. The oil is applied in a coarse spray using 5 to 10 pounds of air pressure; no exhaust system is required. Application is made only to the center of the sheet, as the rollers spread it evenly to the edges.

• • •

If you desire further information on any idea, announcement, lead or suggestion presented, please write us. Perhaps you know of an idea or "shop wrinkle" that has effected a reduction in operating costs at your plant. If so, won't you send it along?

The Editors

Five Money-Saving Ideas

Drawing dies for forming the bottom of comparatively small diameter tanks can be made from boiler plate at a saving of 20 per cent of the cost of regular die stock. The shapes involved in the die are torch cut and welded together. Hard facing material then is welded to all wearing edges, thus assuring long life. In one case a die of this type has drawn over 12,000 bottoms for pole type transformer tanks.

• • •

Cup-grease lubricants with a certain amount of fluidity have been found highly satisfactory for lubricating overhead crane bearings packed in wool waste. Drippage of the lubricant onto the floor beneath is eliminated.

• • •

In many hot and cold mill, annealing, inspecting, warehouse and other departments at steel plants the electric cranes operate at more than 35 feet above floor level and it frequently is difficult to communicate with the crane operator. If a telephone is installed in the operator's cab the shipping clerk and other workers are enabled to give loading instructions, regardless of where the crane may be along its runway.

• • •

Incrusted India ink can be removed easily from ruling pens used by draftsmen in engineering departments by the application of a strong solution of ammonia applied with a soft cloth. After cleaning, the pen should be rinsed in water and thoroughly dried.

• • •

Internal corrosion of idle boilers at blast furnaces and steel plants can be prevented in a simple manner. After the boilers are emptied and dried trays of unslaked lime are placed inside and all manholes and other openings sealed hermetically. The lime will absorb any moisture, carbonic or sulphurous acid on the interior of the boiler. The remaining salt or magnesia chloride, being in a dry state, will cause no damage.

Withstands High Stresses

Air hardening steels containing 1.25 chromium, 0.75 silicon, 1.00 tungsten, 0.30 vanadium and 0.45 carbon are highly suitable because of their creep strength for bolts and studs subjected to high stress at temperatures ranging from 1000 to 1100 degrees Fahr.

• • •

Prevents Motor Overload

Protecting the motors which operate the feeder and catcher tables of conventional type sheet mills against overload is accomplished by mounting a thermostat directly in the

Greater Production - More Uniform Annealing with Vertical Tube Type Wilson Furnaces

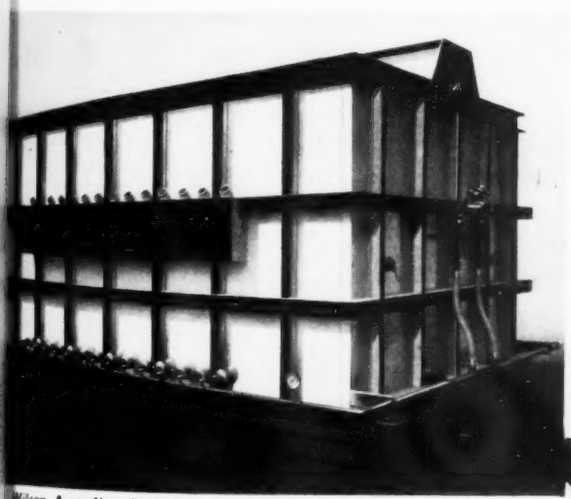
Our new Wilson Vertical Type Radiant Tube Annealing Cover will give you 20% **GREATER PRODUCTION** with more uniform annealing from bottom to top of the charge because the heat is applied where it is most needed—at the bottom of the charge.

The tapering off of temperature from the point of combustion, common to all tube type heaters, is utilized here to give the proper temperature gradient for uniform heating from the bottom to the top of the charge.

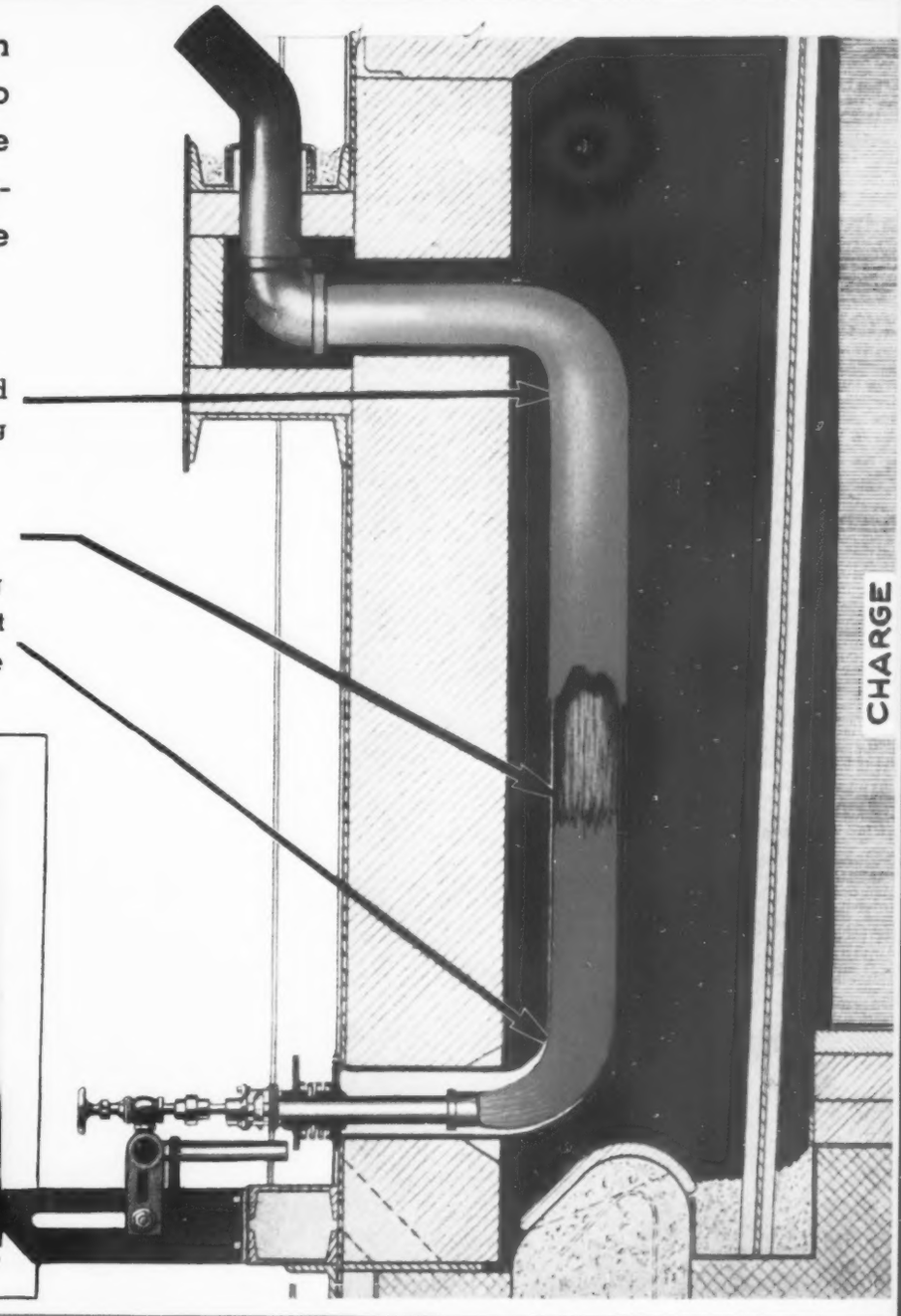
The upper portion of this tube absorbs and radiates heat from spent gases for heating the upper section of the charge.

Combustion completed at this point.

Maximum production with uniform heating can only be obtained by applying the heat at the point normally hardest to anneal—the bottom of the charge.



Wilson Annealing Unit is covered by Patent No. 1952402 and other Patents Pending.



The WEAN ENGINEERING COMPANY INC.

WARREN·OHIO·

The Wilson Annealing Units sold by us are an exclusive development of

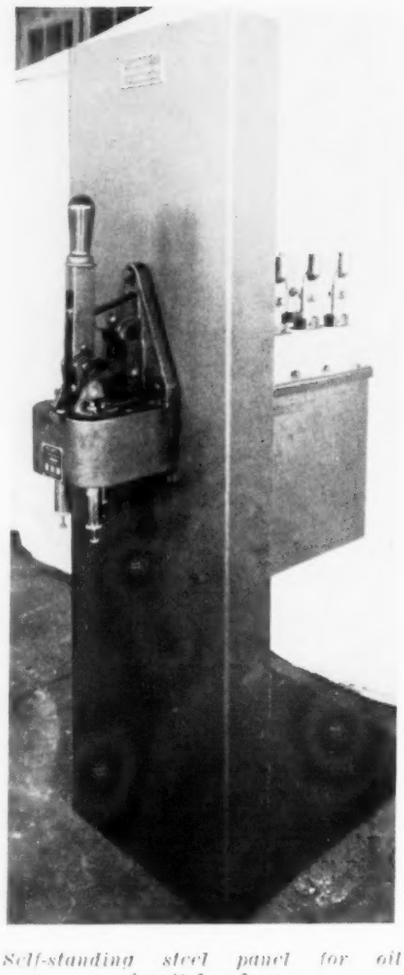
motor to indicate the approach of a dangerous temperature. A simple thermostat developed for this purpose, consists of a bimetal disk so constructed that its contacts snap open at a given temperature and either disconnects the motor from the line by dropping out a contactor or gives advance warning by means of a suitable signal that an abnormal condition exists.

New Devices for Handling Reels and Steel Sections

A reel roller bearing has been developed by the Smith Power Transmission Co., Penton building, Cleveland. As shown in the accompanying illustration, it is designed to eliminate the friction between wooden cable reels and the steel bars on which they are wound and unwound, as well as the friction between the bar and the conventional type of reel bar holder. With the new reel roller bearing the friction is cut down so that one man can operate the reel with ease, and at a fast or slow rate in accordance with requirements.

Capacity of the reel roller bearing is 6000 pounds and the bearings will accommodate reel bars 1 to 4 inches in diameter. The bearings themselves are made up with six hardened steel rollers operating on hardened steel studs. The base of the bearing is flat and it can be attached to any suitable support where wire rope, cables, rubber conveyor belting, flat transmission belting and other rolled products are handled.

To the right of the reel roller bearing in the accompanying illustration is shown another new product of the Smith company, a roller for handling steel girders and other large steel shapes in long lengths to metal saws, shears and other fabricating equipment.



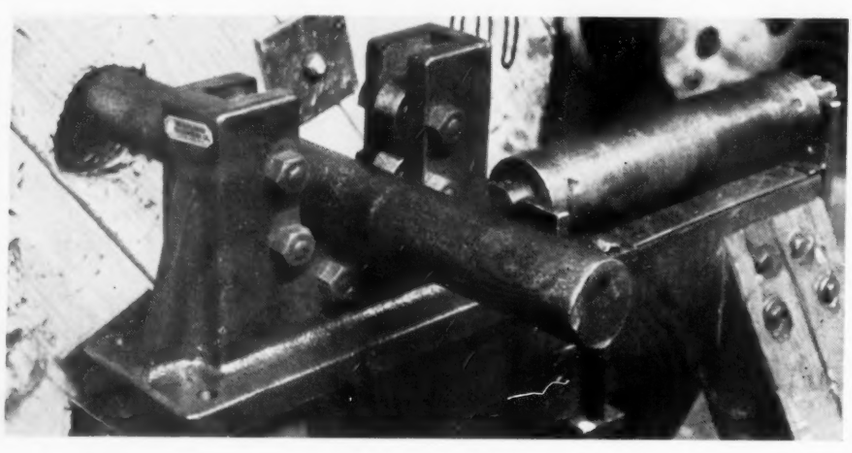
Self-standing steel panel for oil circuit breakers

Circuit Breaker Panel Is Built of Steel Sheets

Self-standing steel panels used for oil circuit breakers and affording an outlet for stretcher leveled sheets are a recent development. The new unit is an outgrowth of the slate panel mounted on iron pipe frames with diagonal floor braces.

The panel, shown in the accompanying illustration, includes sufficient space for mounting several instruments, relays and other accessories. Being built in one unit only a minimum amount of work is involved in their installation. The base is secured to the floor by four lag bolts.

The unit, which is not subject to breakage while in transit or during installation, is made by Roller-Smith Co., Bethlehem, Pa.



Two new handling devices are shown herewith. At left is a reel roller bearing for eliminating friction between cable reel and reel bar and also between reel bar and reel bar holder. At right is a roller for handling girders and other steel sections in long lengths to metal saws and other fabricating equipment

Molybdenum in Steel from The English Experience

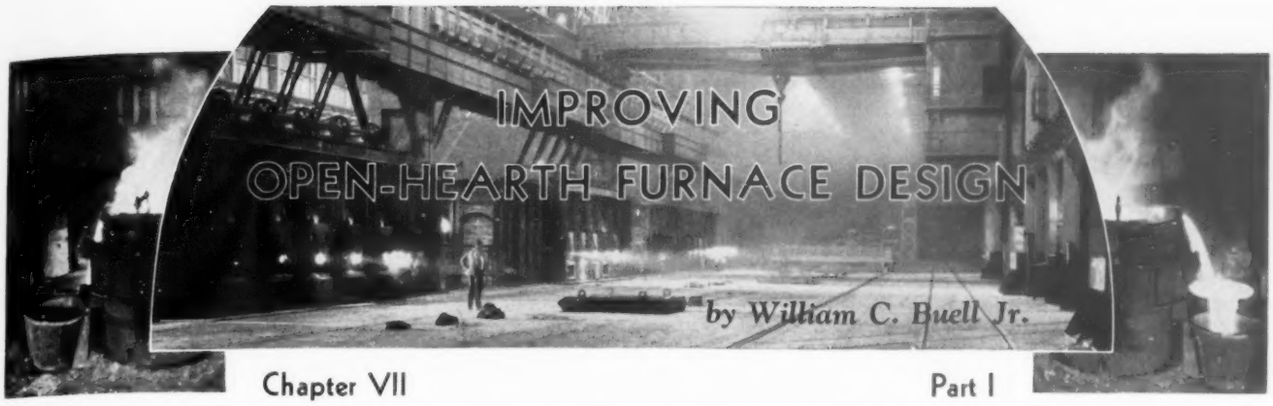
Molybdenum Steels, by Julius L. F. Vogel and W. F. Rowden; cloth, 103 pages, 7 x 9¾ inches; 49 illustrations and diagrams; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, for 5s. plus 6d for postage.

This treatise has been published in collaboration with the firm of High Speed Alloys Ltd. and is the result of research and experience in connection with the rapid development of the use of molybdenum in steel. The increasing use of this element is due mostly to the important influence it exerts in the improvement of the mechanical properties of steel, both at normal and elevated temperatures.

In this book the functions of molybdenum are dealt with mainly from a practical point of view. The main chapter headings are: Molybdenum: Properties, alloys and compounds; chemical products; determination of molybdenum in ferro-molybdenum, calcium molybdate, molyte and steel; addition of molybdenum to steel; manufacture of a molybdenum steel by acid process; casting; treatment of ingots and castings after casting; ingot defects; segregation; forging, rolling and stamping; rough machining, forgings, bars; heat-treatment; types of molybdenum steels, their characteristics and properties; special molybdenum steels and alloys; economic value of molybdenum steels.

Issues Report on Canadian Machinery Trade for 1934

Avery B. Peterson, United States assistant trade commissioner at Ottawa, Ont., has compiled a 27-page report entitled "Canadian Machinery Trade—1934." Copies may be had at 10 cents each from the machinery division, bureau of foreign and domestic commerce, Washington. The report analyzes conditions in the machinery trade of Canada, including production and imports. It cites trends and statistics.



IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter VII — Part I

Distribution and Flow of Fluids in Regenerator Chambers

Any design of checkerwork will be only as effective as the distribution of the fluids over and below the checkers.

THIS seldom applied and little understood axiom points to the base from which all checker design should proceed. Both the horizontal top or bottom surfaces of any vertical flue checker system present a large number of small flues into each of which it is desired to direct a proportionate volume of the furnace gases, air or fuel entering the checker chamber. Such a precise division of the fluids is an ideal condition which never can be achieved, but should be sought and can be approached more nearly than is the usual case in most regenerators.

It will be well to review the action of the several fluids moving under various conditions from the time they enter until they leave the regenerator chambers.

Gas Pressure Varies

The furnace gases are forced to flow into the downtakes at the furnace throat through a differential of pressure, the latter being higher at the furnace throat than at the outlet of the regenerator. In practice and in order to accomplish the differential of pressure necessary to move the furnace gases the pressure at the regenerator outlets (A_{12}) must be definitely subatmospheric, or, in other words, a partial vacuum must be maintained in the flue system. This partial vacuum is produced and continued either by an exhaust fan or stack action.

Fluids moving from one area to another as a result of pressure differential flow by the straightest lines which offer the least resistance. Thus, assuming an excessive checker flue area, the furnace gases upon entering the regenerators should turn to the diagonal path of a width varying with the immediate condition that will lead directly to the regenerator outlets.

When this condition exists there are triangles (in elevation) at the rear of the regenerator chambers above the path of the gases and at the front of the regenerators below the path of the gases and these triangles will vary in area in accordance with the magnitude of the draft. The condition just described indicates an excessive velocity and its correction is accomplished by control of the draft, which when reduced, retards velocity and thus permits a spreading out of the furnace gases to occupy and flow through a greater volume of checkerwork which will then act more effectively as a heat exchange device.

At the other extreme is the furnace system having a "bottle neck" through which, in order to move a large volume of furnace gas, it is necessary to develop an excessive subatmospheric pressure. As pressure, either sub or super, and velocity are functions of each other (see chart Fig. 46 for these relations under open-hearth operating conditions) it immediately follows that excessive pressure produces excessive velocity.

The location of the bottle neck that acts adversely on the flow of furnace gases into the regenerator chambers usually is found at area A_2A. The considerable extent to which this condition exists in the typical furnaces is indicated in columns e, f and g, Table CXVIII. Where areas $A_{11}A$ or $A_{12}A$ are mentioned in this chapter they refer to the air regenerator chamber only when discussing producer or mixed gas firing, and to A_{21} or A_{22} when discussing firing with any other fuel.

Subject to Physical Laws

As all gases have substance and the furnace gases considerable, it follows that when in motion gaseous fluids are subject to the physical laws of momentum and, consequently, the higher velocity the higher the momentum and resistance to deviation from the line of flow they happen to be following.

The result then from the constriction of the area $A_{11}A$ producing high velocity is to cause the gases to flow rapidly over the tops of the checkers towards the end of the regenerators where through loss of dynamic head by impact or friction the velocity is lost and the gases then flow downward but largely towards the regenerator rear through the checker flues under the influence of stack draft. Excessive angularity in the fantails either in the horizontal or vertical plane tend to accentuate the effect of high velocity or otherwise adversely affect distribution.

After entering the checker flues the furnace gases will flow in the straightest and least lanes to the regenerator outlets at $A_{12}A$.

As a prerequisite of improved checker design area $A_{11}A$ must be designed to the appropriate size and shape and the fantails developed with the minimum of angularity in either plane in order that the best possible distribution of the furnace gas be secured above the checkers.

Balanced Operation Is Best

Air flows into the bottom of the regenerator chamber through the regenerator outlets $A_{11}A$. With natural draft operation it moves under a stack action occuring in the regenerators and uptakes and therefore, is, under a subatmospheric pressure when entering the chambers. As a result of thermal action it may be under a slight superatmospheric pressure at the top of the regenerator chamber but this is not usual. Forced draft or mechanical delivered air at high operating capacities may cause a plus pressure to exist throughout the system to the furnace throat. Best operation should show an approximately balanced condition, that is, that air be supplied only as rapidly as it is used at the furnace.

In any event, the volume of air is inherently less both at standard, specific and relative conditions than the furnace gases (see columns a and b, Table CXVIII) and, therefore, flows at lesser velocity; if properly controlled it should develop superior properties of distribution when compared to the furnace gas.

If a forced draft fan has incorrect characteristics, or the air improperly is introduced into the system, then excessive velocity through area $A_{12}A$

may cause the air to flow by its own momentum to the front of the regenerator chamber under the forward portion of the checkerwork and, thus, cause only the checker flues at the front to receive and pass the air.

Relatively little trouble in distribution will be encountered in producer or mixed gas regenerators either from the effluent furnace gases or incoming fuel gas. This is due first to the small volume of furnace gases that reach the gas regenerators thus assuring low velocity through $A_{11}G$ and above the checkerwork; and second, to the fact that the fuel gas always will be under definitely superatmospheric pressure and that movement through the checkerwork will result from the extrusion of a static fluid rather than from dynamic flow.

Comparison Is Depicted

Diagrammatic plan views of two regenerator chambers are shown as A and B, Fig. 151. A chamber of good inlet and outlet layout is designated A and one having a poorly designed entrance and exit by B. At low velocities it is patent that the distribution of both gas and air will be good in A and that one fluid generally should follow the counter course of the other.

Consider now the effect if the velocity of the furnace gases through $A_{11}A$ is increased and by momentum forced towards the rearward portion of the checkerwork through which they flow vertically downward to the outlet $A_{12}A$. Consider also that the velocity of the air likewise is increased through $A_{12}A$ so that it flows towards the front of the checkerwork and then vertically upward to its exit at $A_{11}A$ and follows essentially a different path through the checkerwork.

It will be evident that under this condition the checkerwork heated by the furnace gases will not be cooled by the counterflowing air and ultimately the checker brick at the rear of the chamber will reach excessive temperature and the air will reach the furnace underheated. This, a common condition, is the cause of the failure of the checker brick through fusion.

The conditions in B are somewhat different showing a material constriction at $A_{11}A$ and $A_{12}A$ and with both the fantail and the connecting flue acutely angled. In this diagram it is evident that even with low and satisfactory entering velocities of furnace gases and air there will ever be a considerable portion of the checkerwork (shaded) that will be ineffective and that maldistribution of the fluids will cause the overheating and ultimate failure of a portion of the checkerwork.

In the B arrangement, increasing the fluid velocities will serve to accentuate the faults of design and operation.

Large Slag Pockets Effective

It has been shown in Table XCI that considerable quantities of dust enter the regenerator chambers. It is obvious that the lower the velocity of the furnace gases through the slag pockets and fantails, the more dust deposited therein, whereas at higher velocities the greater the quantity of the dust which will enter the regenerator. This indicates that ample and effective slag pockets are a great aid to effective checker operation and long life.

However, even though the furnace gases hold considerable quantities of dust entrained when entering the regenerators, a velocity sufficiently low over the checkers will cause the gases to release the dust most of which will fall through the checker flues to be

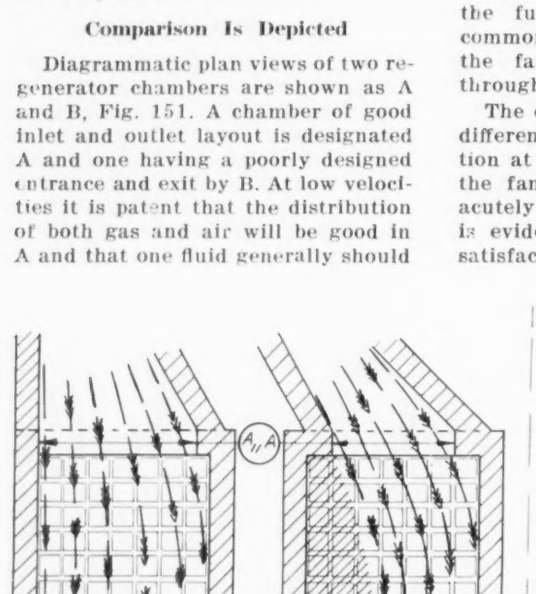


Fig. 151—Demonstrating the effect of angularity in fantails and connecting flues on fluid distribution

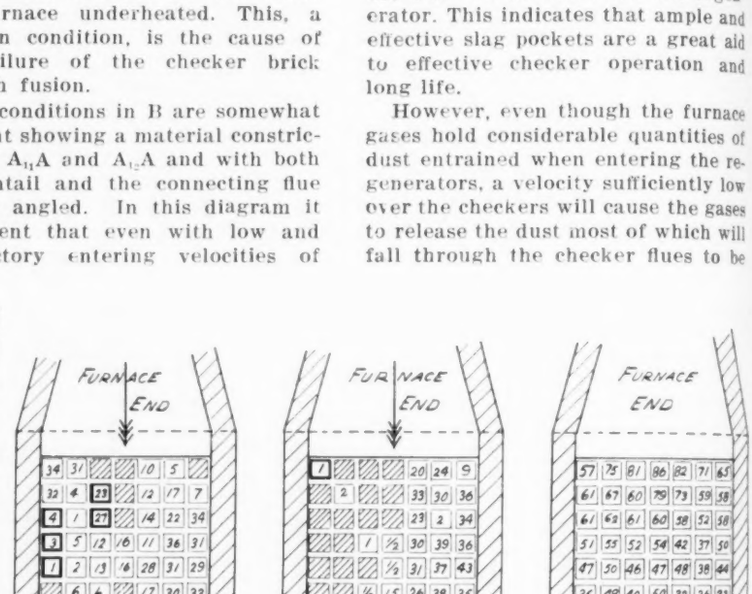


Fig. 152—Relative velocities of fluids through checker flues with 6 x 6-inch openings showing distribution

deposited on the regenerator bottom from which it can be easily removed during a shut down. With a high velocity condition as described for A, the dust inpinges on the rearward walls, adheres and then gradually builds up until it completely blocks off and makes totally ineffective various of the checker flues towards the rear end. With high velocity in B the effects are similar excepting the accumulation starts along the sidewall where the dust loses its velocity either through impingement or friction.

On account of temperature and other conditions surrounding operation it is difficult if not impossible to collect authoritative data regarding actual flow conditions within the regenerator chambers of open-hearth furnaces.

In his excellent paper on regenerative principles McLoughlin* has presented diagrams of flow through checkers, based upon an investigation in a newly rebuilt regenerator chamber. Cold noncombustible fumes to simulate the fluids of operation were moved through the chamber under the influence of a forced draft fan at the inlet and an exhaust fan at the outlet. The checker flues were 6 x 6 inches, and the checker body 11 feet high, and anemometers to determine the flow were placed in the top of the flues.

Results Are Modified

From the collected data McLoughlin presented the results of flow through each checker flue in both directions in the terms of cubic feet per minute. Throughout these works flow affects have been referred to in the equivalent of feet per second velocity and in order to afford an easier comprehension of these results McLoughlin's values have been converted to the terms of that equivalent and the results modified to show the relative velocities as they would be with the furnace gas temperature at 2850 degrees Fahr. and the air temperature at 2000 degrees Fahr., both temperatures as at the top of the flues. McLoughlin's diagrams, but with the flow values converted to the relative velocities in feet per second are presented in Fig. 152.

While the diagrams indicate a symetrical fantail design it is doubtful, judging from the distribution, that such a favorable layout actually existed.

Items A and B are representative of furnace gas flow, and the distribution in A probably is good. While higher velocities are found along the right-hand wall, these, generally speaking, are reduced before reaching the backwall. A total of between 20,000 and 21,000 cubic feet of fumes per minute (see Table XCII for volume of operation in typical furnaces) was flowing and the average velocity through the 168 flues was a little over 21 feet per second as at 32 degrees Fahr.

The high velocities in the three upper left-hand flues likely were the result of eddy currents. The counter flow and no flow flues probably resulted from the same cause and none of these three inconsistencies is assumed as of any especial significance.

Essentially, the same volume of fumes were passing in item B during the test as passed in A. From the distribution shown in B it is evident some sort of obstruction or deflector must have been present in the fantail.

Traces Fluid Flow

The resulting distribution closely follows the condition shown in B, Fig. 151. Faulty distribution in B, Fig. 152, makes more than 25 per cent of the checker flues totally ineffective. It also would appear that the fluid-flow is along the right-hand sidewall, then across the backwall and then forward along the left-hand wall towards the fantail, the volume diminishing to zero at about the transverse center line.

In the counterflow example, simulating air-flow conditions, item C, the volume of fluid flowing was about 24,000 cubic feet per minute and greater than the simulated volume of furnace gases. While such furnace gas-air volume ratios might have existed in rare instances in older practice, in any contemporary practice rating the designation of good, there will ever be less air than furnace gas.

Accordingly, to be comparative with the practice under discussion the values of air-flow could well be reduced by about 20 per cent. As shown the average air velocity through the 168 checker flues is 24.7 feet per second.

Distribution Is Faulty

It immediately is apparent that as a result of high velocity and the ensuing momentum in the air stream, the air flows to the front of the regenerator chamber under the checkerwork and instead of the air being well distributed through the 168 flues, nearly one-half of the total volume flows upward in the furnaceward four rows (28) of flues.

A reduction in the air quantity used to a more nearly equitable ratio with the furnace gas volume would probably greatly minimize the maldistribution as delineated.

The foregoing discusses the effects of fluid distribution only in plan where the simple box type checkerwork is used. The discussion of flow in elevation, of equal importance to that of plan, leads through the subject of the general design of the checkerwork into the several possible arrangements to accomplish vertical or horizontal fluid-flow through single or multiple passes.

(To be continued)

*The Theory and Application of Regenerative Principles in the Steel Industry by T. J. McLoughlin. Proceedings American Iron and Steel institute, 1929.

Cast Metals Data Offered In Pioneer Handbook

Cast Metals Handbook, semiflexible cloth; 512 pages, 125 tables, 130 illustrations; published by American Foundrymen's association, Chicago; supplied by STEEL, Cleveland, for $4, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This handbook is the first ever published devoted exclusively to the properties and applications of cast materials. It brings to date information on castings and corrects erroneous and obsolete data on which engineers base their calculations.

While designed especially for engineers, designers and users of castings, it is of definite interest to editors of engineering handbooks, engineering students, instructors in the application of engineering materials and foundrymen.

It is divided into eight sections on recommendations to designers of castings, recommendations to buyers of castings, one section each on properties and applications of cast iron, malleable iron, steel and nonferrous cast metals, a cross index, and an advertising section.

The first section deals with the design of pattern equipment from the point of view of what the engineer should take into consideration when designing such equipment for castings and pointers of material aid to engineers and designers.

Data in the second section deal with information that should be given the producer by the buyer so that the producer can correctly estimate the cost of the job.

The next four sections deal with properties and applications of cast iron, malleable iron, steel and nonferrous metals and alloys. Included in these sections are physical properties; physical constants; properties at room, elevated and subnormal temperatures; ranges of chemical composition; specifications; metallurgy; testing methods; and much other data. Considerable information also is given on cast materials for heat, corrosion and wear resistance, including such data as room and high-temperature physical properties, chemical compositions, service temperatures and resistance of various alloyed materials to corrosive media. Applications of various plain and alloyed materials also are given. The material is thoroughly cross indexed in the seventh section.

NEW EQUIPMENT—

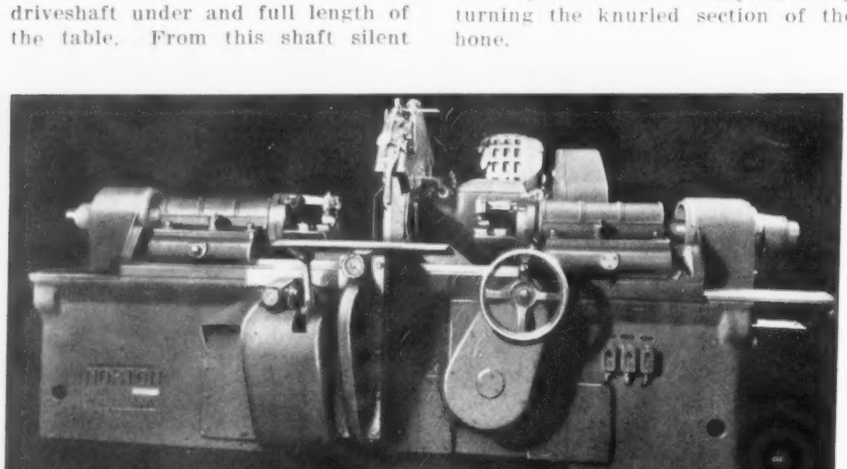
Many Types and Models Are Making Their First Appearance At 1935 National Machine Tool Exposition in Cleveland

Crankpin Grinder—

Norton Co., Worcester, Mass., has developed an entirely new machine known as D-86 shown in the accompanying illustration, for grinding automotive crankpins. Only two levers and one hand wheel are required to operate it. One lever controls the work rotation, opening and closing of the work holders, rapid and slow traverse of the wheel unit up to or away from the work and the rapid movement of the table from one pin to another. The other lever is used for "jogging" the table to bring the pin being ground in line. The handwheel is used to feed the grinding wheel into the work, size being obtained by the use of a grinding gage.

Another feature is the "Lo-Rest," a hydraulically-operated steady rest that drops down clear of the work automatically when moving from one pin to the next, greatly facilitating loading. Ability to stop the work holders automatically in the loading position is a patented feature. Controls are interlocked, making it impossible to move the table by power, for example, while the work is rotating; also, work holders cannot be opened while rotating.

Standard frame motors are used. One drives the wheel unit, another the coolant pumps and the pumps which operate the hydraulic mechanisms. The third drives the work by means of V-belts through a clutch and thence by a silent chain to a driveshaft under and full length of the table. From this shaft silent chains drive each of the work table spindles. Adjustments for synchronizing the work heads are provided. Machine is of the double-head type with work head spindles 6¼ inches in diameter and 29 inches long.



New Norton crankpin grinder is operated by two levers and one handwheel and has features permitting fast and accurate production

• • •

Cylinder Finishing Hone—

Carborundum Co., Hutto Machine Division, Detroit, has developed a new cylinder finishing hone known as the model KKLF automatic. It is designed for finishing on a high-production basis cylinders that have been diamond or otherwise fine-bored. It is shown in the illustration at the right. Segmental members consists of abrasives and fibers, the abrasives removing the stock and finishing the bore, and the fibers acting as guides to prevent scratches and marks when the hone is withdrawn. Fibers also serve to equalize wear on the stones. The company's standard, automatic drive head expands and contracts the stone holders as the hone passes through the piloting and actuating bushings which are used in high production work. Only occasional adjustment is necessary to compensate for wear. As is the case with the company's new manually controlled hone, the new automatic hone has an adjustment for expanding the fiber guides separately and independently; this operation is accomplished by turning the knurled section of the hone.

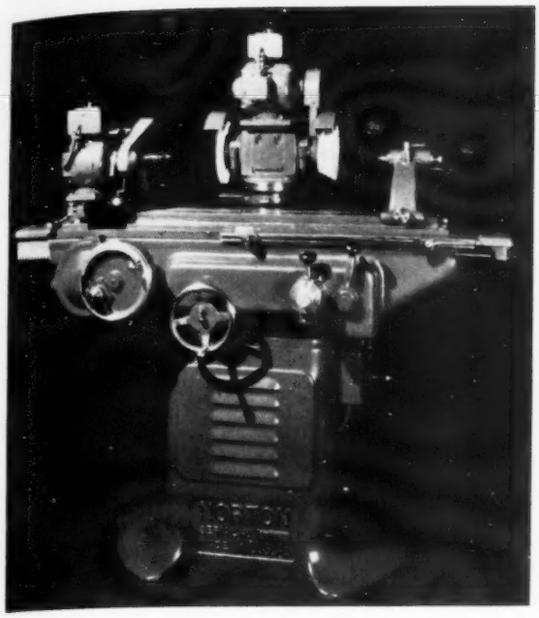
Tool and Cutter Grinder—

Norton Co., Worcester, Mass., has developed a new machine known as its No. 2 universal tool and cutter grinder. This unit is shown in the illustration on page 57. A principal feature is the hydraulic table traverse mechanism for cylindrical or internal grinding or in some cases

Hutto model KKLF automatic hone has been designed for finishing cylinders on a high production basis

the grinding of cutters. A wide variety of equipment and attachments is available for the machine. This includes the universal work head, combination attachment, universal vise, internal grinding attachment and various other accessories. Aluminum castings are used wherever possible, making the units light in weight so that they may be easily moved when changing jobs.

The wheel spindle is driven by V-belt from motor mounted directly above the wheel head on the post which carries the spindle and which can be raised and lowered by an elevating hand wheel graduated in thousandths. The universal work head takes milling cutters with standard tapers. When equipped with the motor drive arrangement the unit becomes a headstock for driving cylindrical work and when equipped with the 3-jaw universal chuck



NO. 2 Norton universal tool and cutter grinder possesses great versatility and can be adapted to wide range of cylindrical or internal grinding

or the face chuck permits grinding of internal work or the sides of thin cutters and saws.

When grinding cutters exclusively the machine can be equipped with left hand headstock which with the standard footstock provides for the grinding of cutters mounted on centers. Both the left hand footstock and the universal work head are graduated for setting clearance angles when backing off cutter teeth. In addition, the universal work head has two sets of graduations by means of which the work spindle can be swiveled both horizontally and vertically and set at any angle.

The saddle of this machine travels on dove-tailed ways, a gib at one side easily accessible for adjustment being provided. A graduated handwheel in front as well as one at the rear permits operating the saddle from both front and rear. Likewise, an apron on the front of the machine, also graduated in thousandths, affords a means of moving the table by hand. This apron is of the 2-speed type, a knob being provided for quickly changing from a slow to a high speed gear ratio. Latches at each end of the table can be quickly disconnected when it is desired to move the table by hand, independently of the hydraulic traverse system of the machine.

A standard frame motor direct coupled to the oil pump is suspended by springs within the base. The wheel spindle, of the cartridge type, runs in two hard bronze bearings, each 1½ inches in diameter and 3⅛ inches long. End thrust is taken up by a flange on the spindle which runs between two bronze thrust plates. End thrust adjustment can be made simply by removing the wheel collet from one end of the spindle. An oil ring carries lubricant from a reservoir in the cartridge up to the spindle, grooves in each bearing distributing it over the bearings.

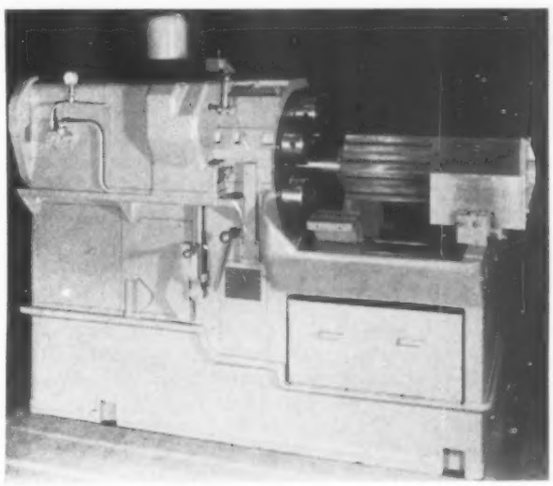
• • •

Six-Spindle Work Rotating Type Chucking Machine—

New Britain-Gridley Machine Co., New Britain, Conn., has placed on the market a heavy-duty, 6-spindle work-rotating type chucking machine designated No. 16. It is designed primarily for boring, turning, facing and forming operations on parts up to and including 9 inches diameter. Spindles are mounted on extra large preloaded antifriction bearings. Tool slide is hexagonal in shape and reciprocates on a hardened steel stem which forms practically an integral unit with the spindle carrier.

The spindle carrier is lifted automatically during the index movement and accurately locked and clamped after the indexing has been completed. Forming arms, two in number, are extra heavy swinging arms with large-diameter circular section bearings and are actuated by individual cams. This construction eliminates wear by chips and grit, and adds to the rigidity without sacrifice of chip clearance. Extra cross arms can be mounted when required, at two additional positions.

Chucks are 9 inches in diameter and can be of two or three-jaw type, or special work fixtures are available to suit individual jobs. Chucks or work fixtures are operated hydraulically by a mechanism built into the machine, shown below, and can be opened in any position at the will of the operator. The regular chucking pressure is adjustable from 50 to 250 pounds to meet the requirements of the job. Hydraulic chucking mechanism is equipped with a device which automatically throws out the feed if for any reason the hydraulic chucking pressure in the chucking cylinders should fall below predetermined requirements.



HEAVY-DUTY 6-spindle work-rotating type chucking machine designated No. 16, developed by New Britain-Gridley Machine Co.

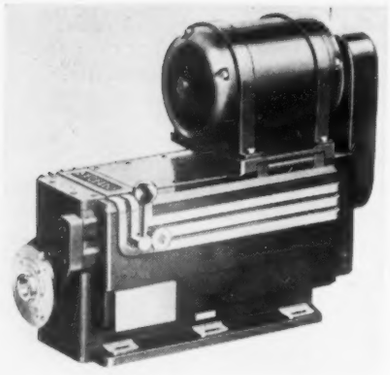
• • •

Hydraulic Power Units—

Ex-Cell-O Aircraft & Tool Corp., Detroit, announces that its hydraulic power unit that was introduced last February, has been brought out in two new models. These units, one of which is shown on page 58, are compact and self contained, and are particularly adapted for drilling, reaming, counterboring, spotfacing and similar operations. They can be mounted either singly or in multiple and are not limited to any one position.

The smaller unit, No. 23A has an 8-inch stroke and the larger unit, designated 25A has a 10-inch stroke. Range of feed on the former has been increased to from 1 to 32 inches per minute with a rapid approach and return of 300 inches per minute. On the 25A unit the range of feed has been increased to from 1 to 32 inches per minute with a rapid approach and return of 230 inches per minute.

Adjustable dogs control the rapid approach, feed, return and stop. Two



New model hydraulic power unit announced by Ex-Cell-O Aircraft & Tool Corp.

forward feed rates, independently adjustable from the side of the unit, permit selection of the proper rate while the unit is feeding. The new operating characteristics have considerably increased the operating range and performance of these units.

♦ ♦ ♦

Swaging Machine—

Langelier Mfg. Co., Providence, R. I., announces a redesigned swaging machine made in three sizes for reducing by swaging the diameter of tungsten wire used in electric light bulbs. The wire can be swaged hot or cold; if swaged hot a heating furnace may be attached to the front cover of the machine.

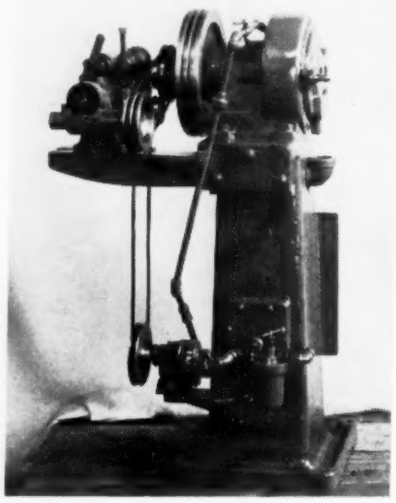
In the new design, shown in the accompanying illustration, a belt-driven roll feed is mounted on a projecting arm at the rear of the flywheel and is driven by a pulley on the swaging spindle which also indirectly drives the lubricant pump. A feed unit consists of a worm and wheel connecting a shaft and gears to two grooved feeding rolls mounted on two swivel drives and pressed together by an open helical spring. This unit is adjustable on the arm and the rate of feed is obtained by changing pulleys. A small lever is provided for opening the rolls and the rolls are quickly interchangeable.

The swaging spindle runs in roller bearings, with oil seals and dust cap. The spindle is ground and the die and hammerblock slot is lined with hardened steel plates riveted into the head of the spindle. A traveling cage with hardened and ground steel rollers travels inside a hardened ground ring that is forced into the head. When the spindle revolves the hammerblocks have striking contact with the cage rolls. Shims are used to obtain the proper squeeze to the dies. Flywheel is driven by V-belts from a motor bolted to side of base, with provision for proper belt tension. A gear pump supplies lubricant to the rolls and dies.

♦ ♦ ♦

Single-Spindle Work Rotating Type Chucking Machine—

New Britain-Gridley Machine Co., New Britain, Conn., is marketing a No. 38 single-spindle, heavy-duty, work rotating type chucking machine. Construction of this unit, shown herewith, is unique in that the boring, turning and facing tools are carried in arms which are supported on circular section steel slides. These slides can be operated longitudinally for turning and boring or transversely for forming and facing operations. They also can be cammed so as to synchronize these movements



Langelier machine for reducing by swaging the diameter of tungsten wire used in electric light bulbs has numerous new features

to meet the requirements of individual jobs.

Massive construction is employed, with 7-inch diameter circular steel tool slides having bearings 10 inches long in the front of the machine and 7 inches long at the rear of the unit. Extra heavy feeds and maximum speeds can be employed because of this rigid construction. In most cases, only single cuts are required to secure desired finish and accuracy.

The machine also can be equipped with a stock feeding attachment so that it may be employed on tubing up to 5¼ inches in diameter. The chucking machine is equipped with an independent hydraulic chuck operating unit, known as No. 202. This arrangement affords adjustable pressures to suit work conditions. These machines are designed primarily for the finishing of rings such as inner and outer bearing races, ring gears and similar parts from forgings or tubing.

♦ ♦ ♦

Duplex Machine for Finish Boring Cylinder Blocks—

W. F. & John Barnes Co., Rockford, Ill., recently designed and built the machine shown in the illustration on page 60 for final finish single point boring of cylinder blocks. This machine and its work holding fixture is completely automatic. Eliminating reaming and rough honing operations, the machine produces straight and round holes which require only a few strokes of the finish hone to produce the desired finish.

This accuracy of finish is obtained by the Barnes system of hydraulic units, valves and controls which is so tied in with the electrical equipment and motors that all mechanisms are controlled by one operating lever. A hydraulically-operated pull bar loads the fixture and unloads it after boring. After the blocks are located and clamped, the machine starts through its automatic cycle.

The slides, carrying four boring units each driven by V-belts and individual motors, move in rapid traverse until the spindles reach boring position. Boring units are arranged to bore alternate holes in both blocks at each operation. After boring is performed, the spindles are stopped and withdrawn without con-

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THIS No. 38 New Britain unit is a single-spindle, heavy-duty, work-rotating type chucking machine

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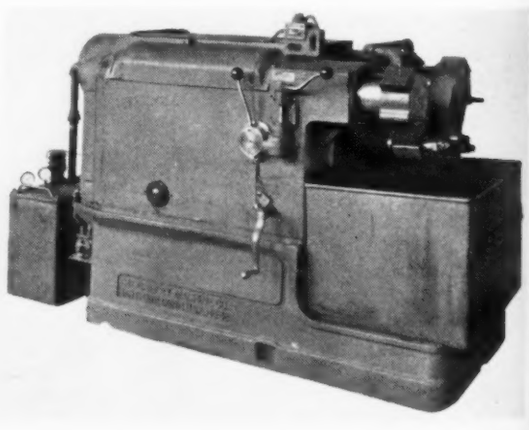

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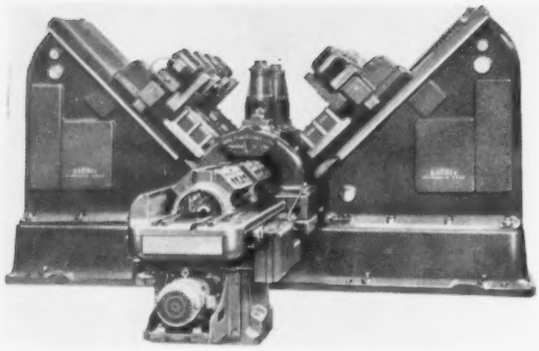
We also roll and sell all grades of Allegheny Stainless in strip form.

WEST LEECHBURG STEEL COMPANY

General Offices: UNION BANK BLDG. PITTSBURGH, PA



THIS Barnes duplex machine was built for final finish, single-point boring of automobile engine cylinder blocks. It is completely automatic and features hydraulic control

tacting the finished surfaces and the slides are returned to starting position. The fixture then is indexed hydraulically for boring the next two series of four holes. These holes bored, the two finished blocks are pushed from the machine.

Boring spindle speed is 520 revolutions per minute with a feed of 0.007-inch. Approximately 0.015 to 0.018-inch of stock is removed in the finish boring operation and all cylinder bores are held to 0.002-inch limit for size. Tool life of the single point boring tools is approximately 800 holes per grind.

◆ ◆ ◆

Stub Lathe—

Sundstrand Machine Tool Co., Rockford, Ill., has developed a 10-inch stub lathe whose operating cycle is fully automatic from the time the tools start their movement until they have completed their work and returned to starting position. This includes rapid approach, feed in to depth, turn face, etc., tool relief if desired, quick return and stop. By the simple adjustment of a dog, cycle can be arranged to repeat itself when automatic work handling attachments are employed.

Four groups of spindle speeds are available, 39 to 400, 57 to 600, 114 to 1200 and 171 to 1800 revolutions per minute. Any of these can be obtained in standard lengths between centers of 16, 22, 34 and 46 inches, with other sizes subject to special order. The new lathe is notable for simplicity of design, ease of set-up and high-speed operation. Bed, headstock and base, which contains coolant reservoir, all are in one rigid casting. Front and rear carriages, power unit and feed control are designed as separate units for bench assembly and easy installation on the main casting. Because of the ease of set-up the machine may be used economically on relatively short runs.

◆ ◆ ◆

Automatic Lathe—

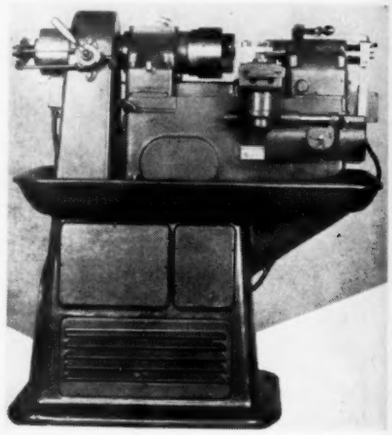
Seneca Falls Machine Co., Seneca Falls, N. Y., announces its new Lo-Swing, Model IMP lathe designed to fill the need for a small accurate lathe, heavy enough to make high spindle speeds practical. It is designed to handle work too small for heavier automatic lathes and hitherto has been handled either on bench lathes which are not heavy enough or on engine lathes which are not fast enough. The new lathe has bench lathe speed plus stamina, compact rigidity and automatic operation.

It weighs 1700 pounds and is capable of a wide range of tooling and adapted to either chucking or between-center work. Because of its accuracy it is being used in one case for finishing turning to replace a former finishing grinding operation and at lower cost. The spindle is large and is mounted on preloaded, precision ball bearings and has speeds up to 5000 revolutions per minute.

◆ ◆ ◆

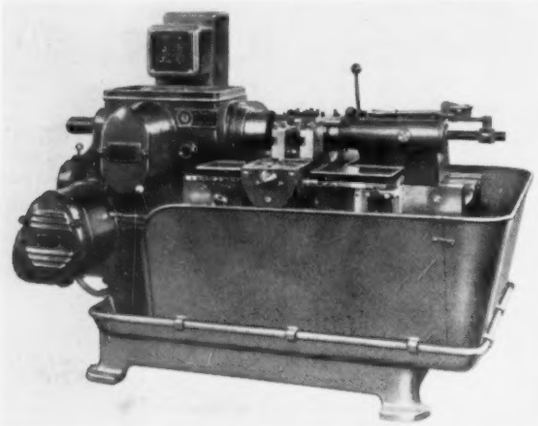
Metal Cutting Machines—

De Walt Products Corp., Lancaster, Pa., announces a new line of metal cutting machines utilizing the overhead principle and cutting with saw blades or abrasive wheels directly driven from the motor shaft or by back gear, permitting two speeds which meet any cutting requirements. They are built in several sizes, with motors ranging up to 20-horsepower, and will cut steel tubes, shapes, angles and flat stock up to ⅛-inch wall thickness with saw blades and stainless, high carbon and alloy steels up to 3-inch wall thickness with abrasive wheels. They may be equipped with saw blades for cutting copper, aluminum, brass and other nonferrous metals several inches thick. Cutting on nonferrous metals is done with hollow-ground steel saw blades, or with inserted-tooth saw blades.

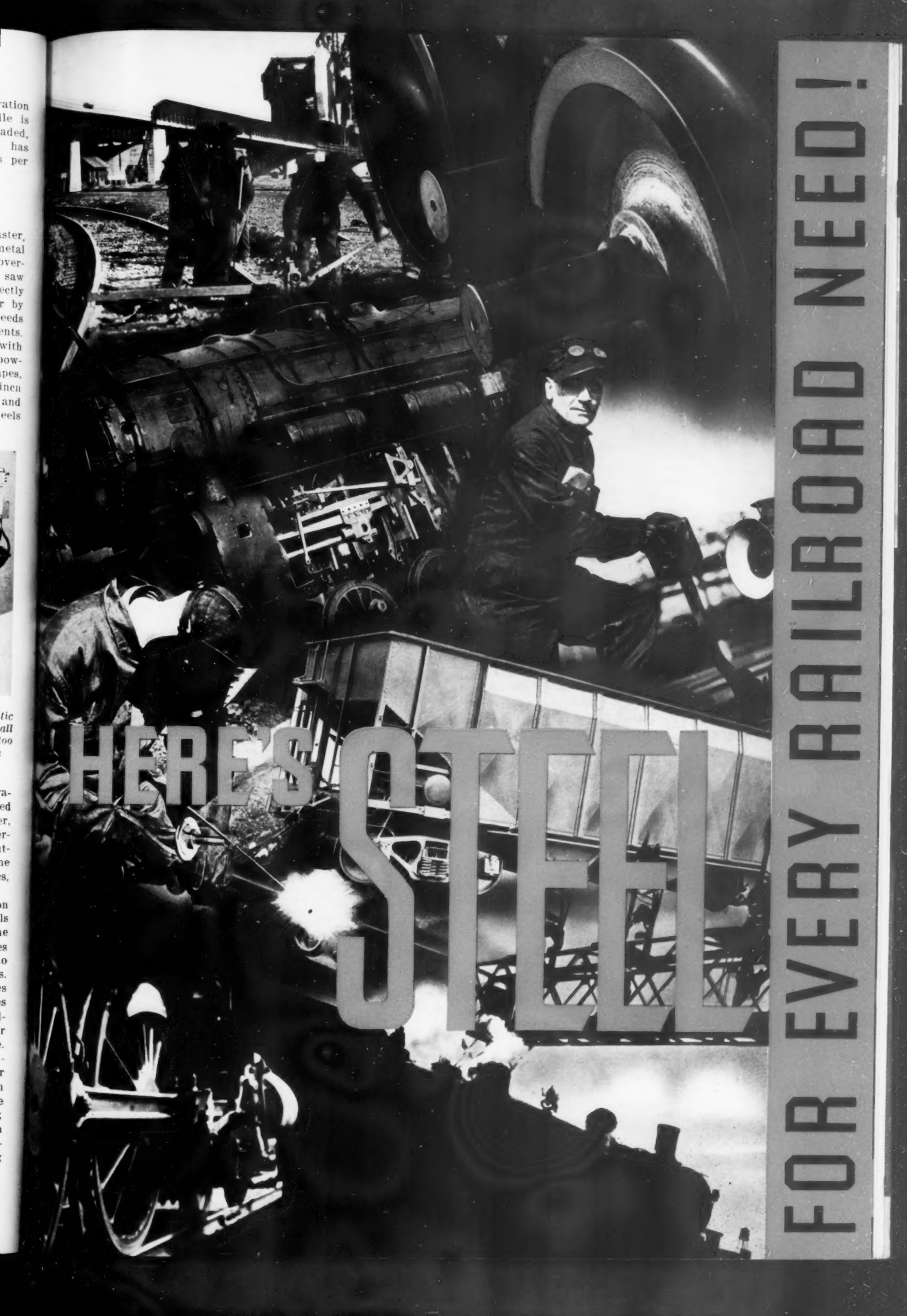


Seneca Falls Model IMP automatic lathe is designed for work too small for heavier automatic lathes and too heavy for ordinary bench lathes

As shown in the illustration on page 65, the cutting tool travels parallel to the table and above the work, permitting cuts up to 24 inches wide. Machines can be built up to 33 inches wide for certain materials. Water, coolants, lubricants or greases can be used in cutting. The machines can be equipped with foot or hand-operated vises or with air accelerator vises operated by foot or hand valve. They can be arranged for hand feeding the cutter to the material or for automatic air feeding. They also can be built into traveling cutters for use with continuous forming machines; they can be arranged to move with the material and so as to cut off without stopping the machine producing



SUNDSTRAND 10-inch stub lathe has fully automatic operating cycle and because of ease of set-up may be used effectively on relatively short runs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Signal Bridges and Towers
Amerite & Americore
Signal Wire
National Signal Pipe
Cyclone Property
Protection Fencing
Keystone Copper Steel
Sectional Culverts
USS Stainless Steel
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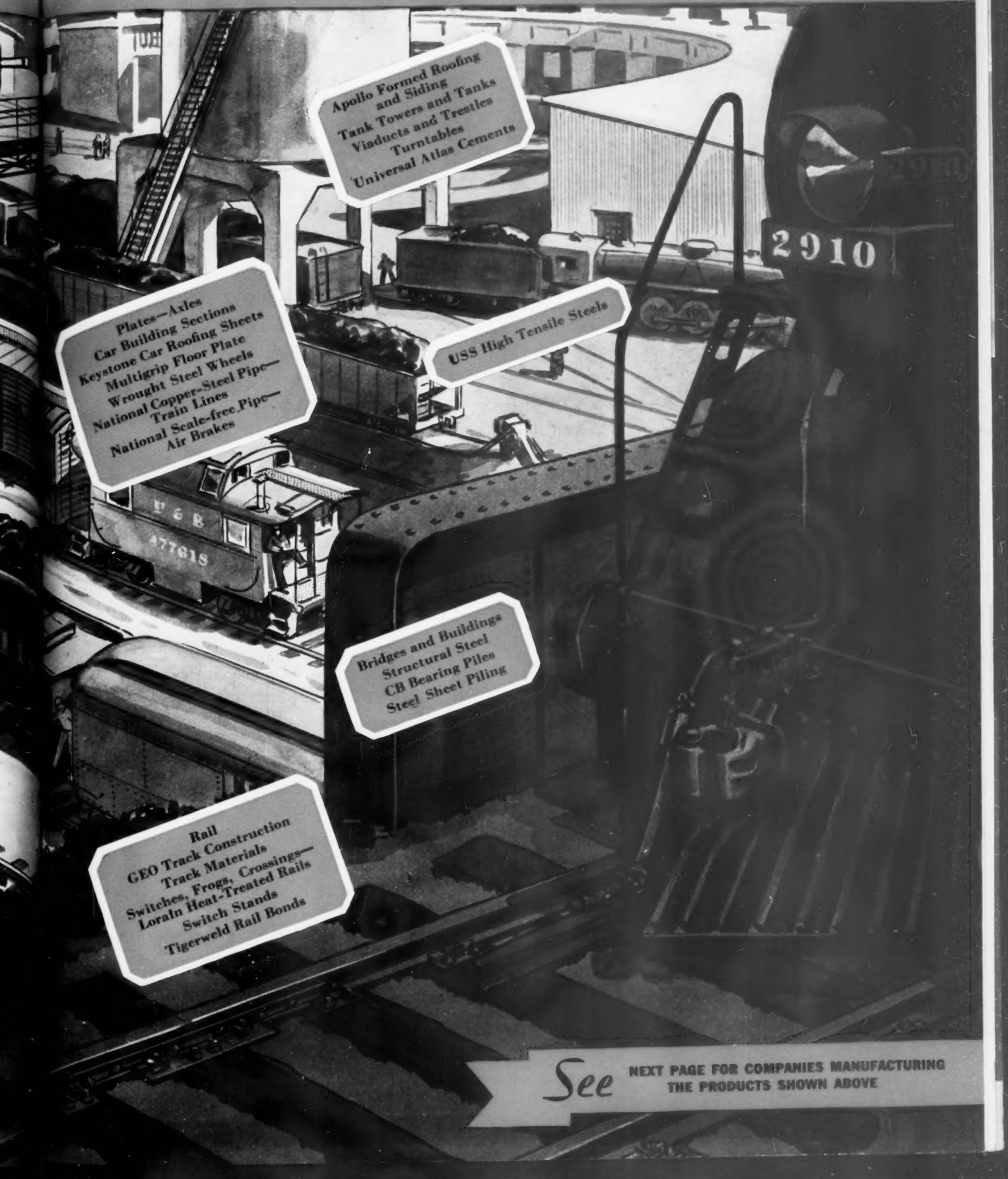
Everywhere IN RAILROADING..



See NEXT PAGE FOR COMPANIES MANUFACTURING THE PRODUCTS SHOWN ABOVE

United States Steel Corporation Subsidiaries

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.—Fabricators and Erectors of Steel Structures of all classes, particularly bridges and buildings; also manufacturers of barges, turntables, transmission towers and component parts, and electric (Heroult) furnaces.

AMERICAN SHEET AND TIN PLATE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.—Manufacturers of Sheet and Tin Mill Products for all purposes—black and galvanized sheets, automobile sheets, electrical sheets, sheets for special purposes, tin and terne plates; Keystone Rust-Resisting Copper-Steel Products; also USS Stainless and Heat-Resisting steel sheets and light plates, and USS High Tensile Steel Sheets.

AMERICAN STEEL & WIRE COMPANY

General Offices: 208 South LaSalle Street, Chicago, Ill.—Manufacturers of Wire and Wire Products—wire fencing, barbed wire, wire rope, electrical wires and cables, nails, manufacturing wires, cold rolled strip steel, springs, and concrete reinforcement. USS Stainless and Heat-Resisting cold rolled strip steel, wire and wire products, and USS High Tensile Steel products.

CARNEGIE STEEL COMPANY

General Offices: Carnegie Building, Pittsburgh, Pa.—Manufacturers of Rolled Steel and Forged Steel Products—shapes, Carnegie beams, piling, plates, bars, flats, axles, wheels, rails and track material, USS Stainless and Heat-Resisting Steel bars, plates, shapes, special sections and semi-finished products, and USS High Tensile Steel products.

COLUMBIA STEEL COMPANY

General Offices: Russ Building, San Francisco, Calif.—Distributors for Pacific Coast territory of products of all the manufacturing subsidiaries of the United States Steel Corporation—Manufacturers of various forms of rolled steel products, flat rolled materials and wire; also black and galvanized steel sheets and tin plates.

CYCLONE FENCE COMPANY

General Offices: Waukegan, Illinois—Manufacturers of Chain Link Fence—also lawn fence, wire screen cloth, wire belting, and wire specialties. Maintains field organizations throughout the country to handle installation of fences.

ILLINOIS STEEL COMPANY

General Offices: 208 South LaSalle Street, Chicago, Ill.—Manufacturers of Rolled Steel and Forged Steel Products—bars, structural shapes, plates, flats, billets, axles, wheels, rails and track materials; also USS Stainless and Heat-Resisting Steel bars, plates, shapes, special sections, and semi-finished products, and USS High Tensile Steel products.

THE LORAIN STEEL COMPANY

General Offices: 545 Central Avenue, Johnstown, Pa.—Manufacturers of Special Track Work and Accessories—also girder rails, castings, mine and industrial cars, forged steel grinding balls.

NATIONAL TUBE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.—Manufacturers of Welded and Seamless Steel Tubular Products—Standard pipe, copper-steel pipe, rotary rolled pipe, electric-welded pipe, hammer-welded pipe, boiler tubes, seamless mechanical tubing, special dipped and coated pipe, cement-lined pipe, cylinders, couplings, and USS Stainless and Heat-Resisting Steel tubes and pipe, and USS High Tensile Steel products.

TENNESSEE COAL, IRON & RAILROAD COMPANY

General Offices: Brown-Marx Building, Birmingham, Ala.—Manufacturers of Rolled, Forged, and Cast Steel products; shapes, plates, bars, flats, black and galvanized sheets, axles and forgings, steel castings, rails and track materials, and USS High Tensile Steel products. Wire products.

UNIVERSAL ATLAS CEMENT COMPANY

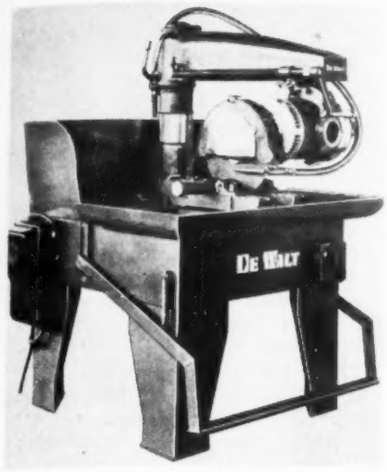
General Offices: 208 South LaSalle Street, Chicago, Ill.—Manufacturers of Atlas Portland cement, Universal Portland cement, Atlas White and Atlas *Waterproofed* White Portland cement, and Atlas Lumnite cement.

SCULLY STEEL PRODUCTS COMPANY

WAREHOUSE DISTRIBUTORS—General Offices: 1319 Wabansia Avenue, Chicago, Ill.—Operates group of strategic manufacturing and shipping centers to facilitate prompt service. Steel products direct from warehouse stocks.

UNITED STATES STEEL PRODUCTS COMPANY

EXPORT DISTRIBUTORS - - - - - NEW YORK, N. Y.



De Walt metal cutting machine cuts all ferrous and nonferrous metals at high speed and at any angle and also can be arranged as a traveling cutter for use with continuous forming machines

the material. For this and other applications the machines may be full or semiautomatic.

♦ ♦ ♦

Light Milling Machines—

Kearney & Trecker Corp., Milwaukee, is introducing No. 2 size model H light milling machines to meet the requirements of light milling operations for both general manufacture and toolroom service. The new line, one of which is shown herewith, is furnished in the plain, universal and vertical types.

These machines are powered with 3 horsepower motors. Tables are 10 inches wide by 49½ inches long and have the conventional No. 2 power feed range of 28-inch longitudinal, 10-inch cross and 17-inch vertical movements. These are high speed machines. They are provided with 16 quick change speeds with optional ranges of either 20 to 800 or 50 to 2000 revolutions per minute. There are 16 quick change feeds, single dial control, with optional ranges of either ¼ to 10, ½ to 20, or 1½ to 60 inches per minute. No. 2 H light machines have the No. 40 national standard spindle and are furnished with complete antifriction bearing drive. They feature the double overarm support to the arbor on horizontal machines and the vertical model is of the sliding head type with 4-inch vertical head travel and 14-inch throat distance. The No. 2H light universal is provided with a new 8-inch ball bearing dividing head.

♦ ♦ ♦

Automatic Lathe—

Seneca Falls Machine Co., Seneca Falls, N. Y., has developed a Lo-Swing, Model U, automatic lathe shown in the accompanying illustration. It is designed for work of wide variety such as turning pistons, bushings, stem pinions, steering knuckles and other short cylindrical work. It can be used for straight turning or forming or a combination of both. It can be arranged for profitably machining simple jobs coming through in small lots or to handle jobs economically on a high production basis, with the cost of changing over small.

The new model is completely automatic; the operator merely places the work. When the machine is started it makes a complete cycle and stops with the carriage slides returned to the starting position. A single lever is operated to bring the tailstock center into position and to start the machine. The machine may be provided for belt, silent chain or direct motor drive. Pick-off gears are provided for changing both speeds and feeds. Ball and roller bearings are furnished for all shafts. Automatic lubrication is employed throughout. Carriage ways are equipped with hardened and ground steel plates. Longitudinal and cross feed movements of the rear forming and squaring slide are obtained by means of hardened and ground cams.

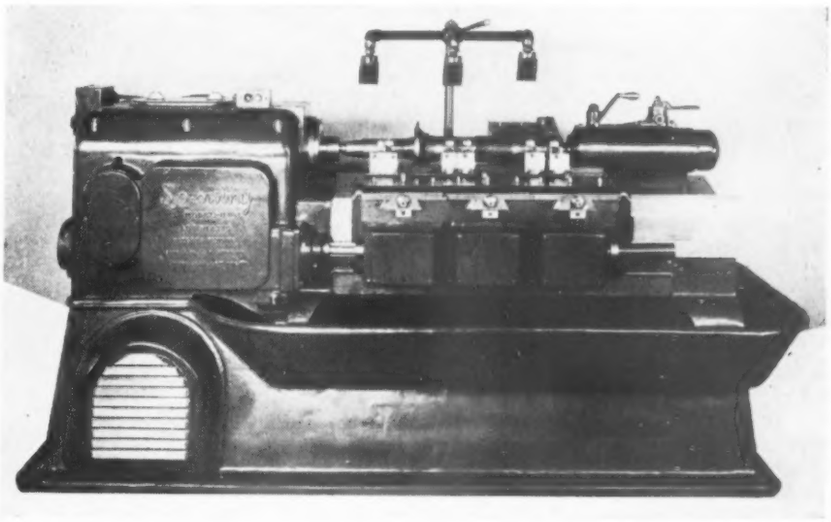
♦ ♦ ♦

Four-Spindle Work Rotating Type Chucking Machine—

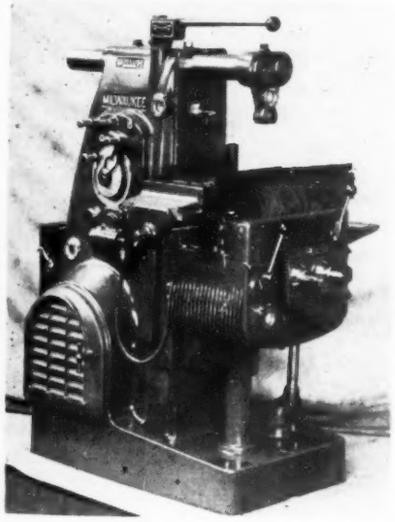
New Britain-Gridley Machine Co., New Britain, Conn., recently brought out a new model No. 14 4-spindle work rotating type of chucking machine. Chucks have a capacity of 6¾ inches and are operated hydraulically with a hydraulic mechanism built into the machine. Chucking pressures are variable to suit conditions of any particular job. Spindles are extra large and are mounted on preloaded ball bearings. An automatic spindle carrier lifting and clamping mechanism is provided to eliminate wear at the vital locating points.

Cross slides are mounted on hardened and ground cylindrical steel studs which entirely circle their bearings, and are protected from chips and dirt. All rotating shafts are mounted on antifriction bearings. Automatic lubrication of the force feed circulating type is provided to all parts and mechanisms. A rectangular tool slide, hardened and ground internally and externally, reciprocates on a hardened steel stem which forms practically an integral unit with the spindle carrier.

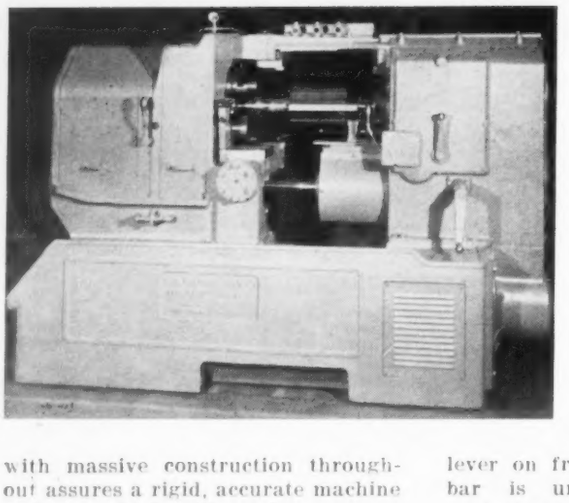
Auxiliary slides for carrying tools independent of the main tool slide can be applied in the two upper positions. Carefully selected materials



Lo-Swing Model U Seneca Falls automatic lathe is designed for turning short cylindrical work and can be used for straight turning or forming or a combination of both



Kearney & Trecker No. 2 size model H light milling machine



NEW Britain model 14 4-spindle work rotating type chucking machine. Chucks are operated hydraulically

with massive construction throughout assures a rigid, accurate machine and one which will retain accuracy. A wide range of spindle speeds is available, suitable to modern cutting steels and materials.

♦ ♦ ♦

Turret Lathe—

Foster Machine Co., Elkhart, Ind., announces its new No. 1 turret lathe, shown in the accompanying illustration, designed to meet present-day demands for high spindle speeds. It has a regular automatic chuck capacity of 13/16-inch which may be increased to 1 1/16 inches. It offers speed of operation, accuracy and rigidity unattainable in the machines of older design.

A 4-speed motor mounted in the base drives a 2-speed transmission, also in the base. Drive from transmission to spindle is by V-belt. Eight spindle speeds, ranging from 300 to 3600 revolutions per minute, are selected by dial; different spindle speed ranges may be furnished if desired. Spindle is mounted in precision ball bearings and is equipped with brake for quick stopping.

The machine is arranged with hand-operated automatic chuck and bar feed or with cam-operated automatic chuck and bar feed as desired. With the cam-operated automatic chuck and bar feed the opening and closing of the collets and feeding of bar is done mechanically and all that is required of the operator is to engage a clutch by means of a small lever on front of machine, and the bar is unclamped, fed forward against stop and reclamped automatically in approximately 1 second. The bar is supported inside of a tube and is fed into the machine by means of feed fingers which feed the bar up to the end of collet. When bar is used up and new bar reloaded the bar support tube is swung forward so that the new bar may be loaded from the operator's end of rack.

The machine is equipped with lever-operated cross slide or a combination screw and lever-operated type cross slide may be furnished. Turret is automatically unclamped, indexed and reclamped by the backward and forward movement of the turret slide. Bed is equipped with adjusting block for quick leveling.

♦ ♦ ♦

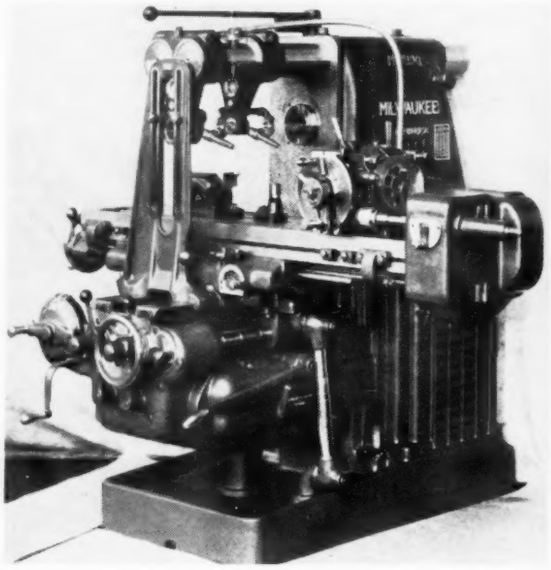
Milling Machines—

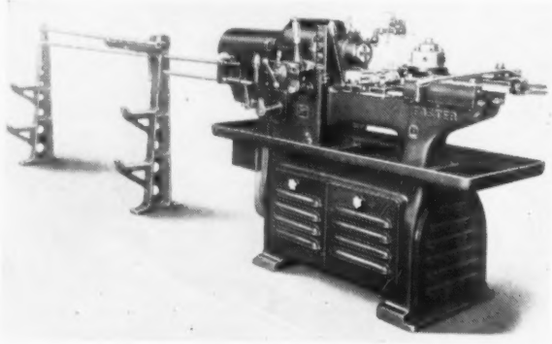
Kearney & Trecker Corp., Milwaukee, has redesigned its line of model K high speed, wide range knee type milling machines. The principal feature incorporated in the new design, shown herewith, is the convenience of duplicate front and rear control for both hand adjustment and power feed operation. There has been added a new safety feature embodying a complete and positive interlock so that hand cranks cannot be left attached or accidentally revolve when power feed or power rapid traverse is engaged.

Model K machines have 24 spindle speeds in one continuous series in approximate geometric progression without any speed overlapping the others. Speed selection is made at the left side of the column with a single lever and large direct reading dial. Any speed on the dial can be selected by rotating the lever clockwise or anticlockwise. It is not necessary to run through the entire range when dropping back to a lower speed. The speed range is 100:1 ratio from 15 to 1500 revolutions per minute on both the No. 2 and No. 3 size machines. There are 32 feeds, also in one continuous series and obtained by a single lever and direct reading dial. Feeds range from ¼ to 60 inches per minute, and can be changed while the spindle is revolving, thus eliminating the necessity of stopping the machine when stepping up the feed another notch.

Another innovation is the chip disposal trough at the rear of the knee

IN THE design of the new model K Kearney & Trecker milling machine the start and stop push button control has been removed from the side of the column and placed directly on the adjustable starting lever. This provides a more accessible, safer and convenient location and makes it possible to run the wiring down inside the hollow starting lever shaft, thereby also improving appearance





FOSTER No. 1 turret lathe offers speed of operation, accuracy and rigidity and a range of eight spindle speeds

top. It is at this point where chips have always piled up and wedged between the saddle and the column face causing scoring and damage to the bearing surfaces. This has been overcome by casting an integral trough in the rear of the knee, thereby permitting all chips to drop down to the column base.

◆ ◆ ◆

Multiple Spindle Automatic Screw Machine—

New Britain-Gridley Machine Co., New Britain, Conn., is announcing a model 41 multiple-spindle, automatic screw machine. Many new features have been embodied in this unit, shown herewith. These include preloaded ball bearing spindle mountings, automatic spindle carrier lifting mechanism, automatic spindle carrier clamping, cylindrical cross slides mounted on hardened and ground steel studs and protected from chips and dirt. A hardened tool slide, ground internally and externally, reciprocates on a hardened and ground tool slide stem which forms practically an integral unit with the spindle carrier.

Materials selected include alloy steel gears accurately machined after heat treatment and alloy steel shafts mounted on antifriction bearings. Force feed circulating type of automatic lubrication is provided to all parts and mechanisms on the machine. With these is combined massive construction with accessibility to the tools and all mechanisms.

A range of spindle speeds is available, suitable to modern cutting steels and materials. Model 41 is of the four-spindle type and is built in several sizes up to 2¼-inch round bar capacity.

◆ ◆ ◆

Lathe—

Seneca Falls Machine Co., Seneca Falls, N. Y., announces a new lathe for taking full advantage of carbide cutting tools. Known as the Speed-cut, it is designed for single point turning or modified multiple tool turning. It is available with or without rapid traverse to the carriage, and also with completely automatic rapid traverse to the carriage. The spindle, mounted on precision, preloaded ball bearings, has no gears and is driven direct through V-belts from a variable speed motor or a New Departure Transitorq unit. Spindle pulley is mounted on its own ball bearings, eliminating belt pull. Spindle speeds to 3600 revolutions per minute are available.

Carriage feed mechanism is driven through V-belts to pick-off gears. Three quick changes provide a feed range of 0.001 to 0.06-inch per spindle revolution. Apron is of the double-wall type and the carriage is extremely heavy.

A form turning attachment is available which permits the machine to be used for turning straights and tapers from a templet bar. Also, when taper work or work having different diameters is being turned, the spindle speed automatically may be changed so that the proper speed for each diameter is maintained. Machine shown in the illustration is equipped with a follow rest so that gun barrels and similar work having straight and taper proportions may be adequately supported while being turned.

◆ ◆ ◆

Multiple Spindle Automatic Screw Machine—

New Britain-Gridley Machine Co., New Britain, Conn., is announcing a model 60 unit which is a development of the 4-spindle models 40 and 41 of its automatic screw machines. This design, shown herewith, being of the 6-spindle type, has a hexagonal reciprocating tool slide. Each face of the slide has an accurately machined and ground dovetail in which the tool holders are located. These holders are easily and quickly adjusted for position and are readily removable. One screw locks the tool holders securely in any desired position. The same dovetails are utilized for sliding tool holder brackets in which tools requiring movement independent of the main tool slide are carried.

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SENECA Falls Speed-cut lathe as set up with follow rest so that gun barrels and similar work having straight and taper proportions may be supported while being turned

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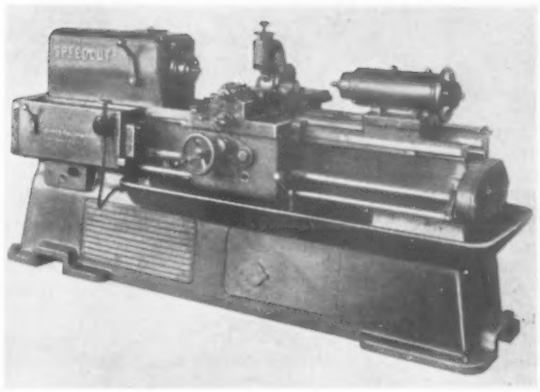

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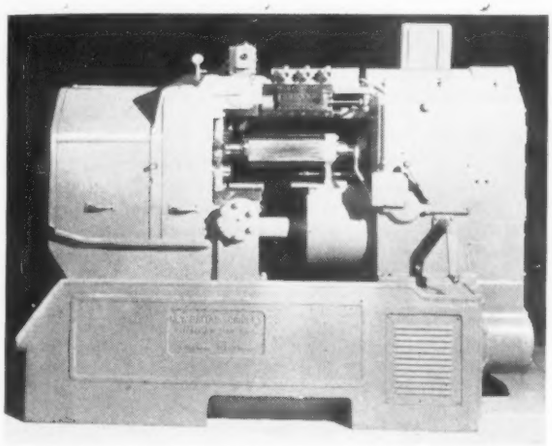

THIS model 41 New Britain-Gridley unit is the first of a new line of multiple-spindle, automatic screw machines

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DEPICTED here is model 60 which the New Britain-Gridley Machine Co. offers as a development of its 4-spindle models 40 and 41 automatic screw machines

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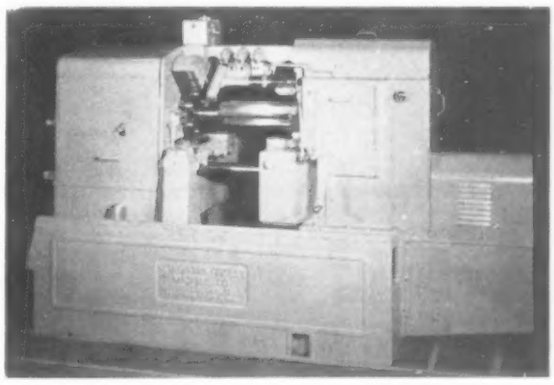


New Trade Publications

Lubrication—Texas Co., 135 East Forty-second street, New York. The July issue of its serial on lubrication, devoted to the canning industry.

Microscopes — Bausch & Lomb Optical Co., Rochester, N. Y. A booklet on laboratory microscopes and accessories.

Lubrication—Alemite Corp., Chicago. A manual of 54 pages with tab index, covering its line of lubrication equipment, illustrated.

Protective Devices—Willson Products Inc., Reading, Pa. A catalog of protective devices for head, eyes, nose and throat for use in industrial plants.

Chromium Plating—Pratt & Whitney Co., Hartford, Conn. Circular No. 414 on commercial chromium plating as practiced in this company's plant, with illustrations.

Heat-Resisting Castings — Cooper Alloy Foundry Co., Elizabeth, N. J. A folder on stainless and heat-resisting castings describing its products for many purposes.

Hard Facing—Lincoln Electric Co., Cleveland. A bulletin on how to make metallic working surfaces wear longer by hard facing and overlaying, by arc welding, illustrated.

Elevating, Conveying and Power Transmitting Machinery—Palmer-Bee Co., Detroit. Section 107 of its general catalog No. 101, covering the above lines of machinery.

Hot Plates—Hevi Duty Electric Co., Milwaukee. Bulletin HD 835 on its multiple unit hot plates, illustrated, with specifications table and ample text.

Blow-Off Valves — Yarnall-Waring Co., Chestnut Hill, Philadelphia. Bulletin B-419 on its forged steelblow-off valves for 600 to 1500 pounds working pressures, including seatless and hard-seat types.

Transformers—Pennsylvania Transformer Co., 1701 Island avenue, N. S., Pittsburgh. Bulletin No. 320 on heavy duty power, welding and furnace transformers for standard and special requirements.

Tanker Bulkheads — Lukens Steel Co., Coatesville, Pa. A booklet on its proposed tanker bulkhead system for fluid storage, of welded steel, with illustrated record of a destruction test conducted at Coatesville.

Time Controls—Automatic Temperature Control Co., 30 East Logan street, Philadelphia. A 16-page manual, catalog T-C, treating of control of time in industrial operations and processes.

Foundry Conveyors—Mathews Conveyer Co., Ellwood City, Pa. A 50-page book dealing with application of conveyors in steel, malleable, gray iron and nonferrous foundries, 80 illustrations and layouts.

Blast Cleaning — Pangborn Corp., Hagerstown, Md. A folder outlining features and advantages of its roto-blast type of blast cleaning for foundries and other industrial uses without the use of compressed air.

Chucks—Garrison Machine Works Inc., Dayton, O. a folder impressing the idea of best service from concentration on one line of tools, with a suggestion of the specialist giving best service.

Controllers—A. W. Cash Co., Decatur, Ill. A bulletin, No. 963, on its line of supersensitive standard controllers for operating valves, dampers, rheostats, stokers and other appliances.

Tractor Crane—Service Machine & Iron Works Inc., New Orleans. An illustrated leaflet describing its full-swing tractor crane and showing possibilities of its service, with specifications and load chart.

Furnace—Whiting Corp., Harvey, Ill. Buuletin No. 197, devoted to description of the Brackelsberg furnace for producing high-test iron, malleable iron and steel with pulverized bituminous coal for fuel. Well illustrated.

Master Breaker — Worthington Pump & Machinery Corp., Harrison, N. J. A bulletin, No. W-1200-B12, on its No. 10 master breaker and sheeting driver, with illustrations and description.

Air Heaters — J. O. Ross Engineering Corp., 350 Madison avenue, New York. Bulletin No. 122 on its air heaters for industrial oven heating, with illustrations, charts and diagrams.

Nails and Wire Products—Republic Steel Corp., Central Alloy district, Massillon, O., A 40-page catalog of Republic wire, nails, fence posts and other products, illustrated and containing data and prices.

Noise Deadening—Johns-Manville, 22 East Fortieth street, New York. A brochure on deadening noise from mechanical equipment by sound dampening materials and by isolating vibrating mechanisms. No. DS series 275.

Copper-Alloy Steel—Inland Steel Co., First National Bank building, Chicago. A bulletin on copper-alloy steel, containing data on economy in its use for combating corrosion, citing applications where losses have been reduced.

Wood Screw Anchors—Rawlplug Co. Inc., 98 Lafayette street, New York. A booklet containing data on construction, use and advantages of rawlplugs, wood screw anchors, telling size of drill and rawlplug to use with any size of wood or lag screw.

Honing and Lapping Machine—Hutto Engineering Co. Inc., Detroit. A bulletin describing its multiple speed hydraulically reciprocated honing and lapping machine for internal honing of long bores to extremely close tolerances.

Spray Painting—Binks Mfg. Co., 3114 Carroll avenue, Chicago. A revised 16-page looseleaf catalog of spray painting equipment and accessories, including a chart of correct nozzle setups for various classes of painting materials.

Pyrometer Controller — Bristol Co., Waterbury, Conn. Bulletin 389 on its new temperature controller for industrial purposes, up to 3000 degrees Fahr., with self-contained mercury switches.

Lubrication—Imperial Electric Co., Akron, O. A sheet on lubrication of bearings in electrical machinery, containing instructions for the care of ball bearings, ten commandments for their care and pointers on sleeve bearings.

Steel Bearing Piles — Carnegie Steel Co., Pittsburgh. A 78-page book assembling authoritative data on steel bearing piles, much never before published, with discussion of engineering problems and tests and many illustrations.

Caterpillar Crane — Bucyrus-Erie Co., South Milwaukee, Wis. A bulletin, No. L-503, on its CT-50 crane, of heavier construcion, with lifting capacity of 13,900 pounds at 12 feet radius, its 30-foot boom swinging 240 degrees; illustrations, diagrams and data tables.

Gearmotors — Allis-Chalmers Mfg. Co., Milwaukee. Leaflet No. 2203 on its compact self-contained speed reducers with integral or attached motors, giving low-speed drive with high overall efficiency, in eight types, with standard speeds from 6.08 to 1165 revolutions per minute.

Compressors — Pennsylvania Pump & Compressor Co., Easton, Pa. Bulletin No. 163 on its steam booster compressor: No. 164 on its 3-AT and 4-AT air cushion valve compressors, single-stage horizontal roller bearing type, with full illustrations and data.

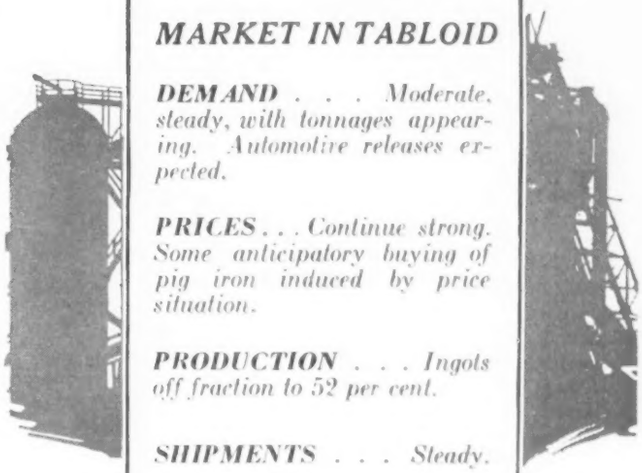
Rolled Steel for Machine Construction—Illinois Steel Co., Chicago, and Carnegie Steel Co., Pittsburgh. A technical booklet suggesting forms of available steel, short cuts to economy in buying, how rolled steel and castings may be combined, suggestions in welding technique, stress relief and other valuable matter.

Belts—Manhattan Rubber Mfg. division of Raybestos-Manhattan Inc., Passaic, N. J. A descriptive bulletin on its Condor whipcord brand of endless transmission belting, with descriptions, specifications, sectional and installation views and technical data and horsepower tables.

Rotary Blower — Roots-Connersville Blower Corp., Connersville, Ind. Bulletin No. 21-B-17, descriptive of Victor-Acme rotary positive blowers, showing power economies and describing other operating characteristics, including controlled volume, positive air movement, freedom from internal seal or lubricant; a selection table gives net capacities at listed speeds and pressures.

Strong Factors Are Ascendant in Markets

Record Order for Concrete Placed; Pig Iron Output Up Sharply; Steel Rate Easier



MARKET IN TABLOID

DEMAND . . . *Moderate, steady, with tonnages appearing. Automotive releases expected.*

PRICES . . . *Continue strong. Some anticipatory buying of pig iron induced by price situation.*

PRODUCTION . . . *Ingots off fraction to 52 per cent.*

SHIPMENTS . . . *Steady.*

IRON and steel has bridged the Labor day holiday with scarcely a tremor and enters a period which is expected to develop somewhat more than a normal fall pickup, plus seasonally heavy demands from automobile manufacturers, and broadening requirements from public works.

Factors making for strength continue dominant, and there is no indication that this expectation will not be realized. Several soft spots have appeared in the market situation, notably a moderate decline in scrap prices at Chicago, a seasonal letdown in specifications for tin plate, and a more protracted changeover period in automobile models, but these are in the minority.

Invariably, steel demand is expected to rise perpendicularly after Labor day, but it takes a week or two to gain momentum, and such is the case this year. The market base, however, increasingly appears broader, and in the past few days large tonnage projects have developed.

The metropolitan water district of Los Angeles has awarded 83,790 tons of concrete reinforcing bars, principally to four makers, constituting probably the largest single order in history; deliveries will be strung over several years, but some Pittsburgh and Youngstown district mills will roll some of their allotment soon.

Estimates of steel pipe requirements for a natural gas line from Rockville, Ind., to Detroit for the Panhandle Eastern Pipe Line Co., Kansas City, Mo., range from 60,000 to 80,000 tons, with distribution a nearby prospect.

A Pittsburgh and an eastern Pennsylvania mill have divided 5500 tons of plates for two Gulf Refining Co. tankers, for which 2500 tons of shapes and bars already has been placed. Other sizable plate business includes 4500 tons for an Ogden canyon pipe line, and 7500 tons for 30 Mississippi River Barge Line Co. barges.

Railroad requirements are big news, though chiefly on the Canadian side of the boundary. Canadian National has ordered 1180 freight cars, 15 locomotives and 8 snow plows; Canadian Pacific has bought 1120 freight cars. American car awards of the week total 112, plus conversion of 320 box cars and repairs to 500 hoppers.

In building, the week's reinforcing bar awards shot up to 85,781 tons as a result of the aforementioned Los Angeles booking. Structural awards of the week totaled 15,746 tons.

On the operating side, the situation is brisk. Finishing mills suffered some losses from last Monday's shutdown, but ingot production slipped only half a point, to 52 per cent, which is almost triple the rate a year ago. Losses were registered in these districts: Eastern Pennsylvania off ½ point to 32½ per cent, New England off 3 to 70, Buffalo off 5 to 32, Youngstown off 2 to 60. Detroit was unchanged at 94, Cleveland-Lorain at 56, Chicago at 57. Wheeling was up 6 to 84, Pittsburgh 1 to 45, Birmingham 5 to 45½.

Not only was pig iron production up 15.7 per cent in August, to a daily average of 56,767 tons and a monthly total of 1,759,782 tons, but as September opened 98 stacks were in blast, a gain of 6 over the beginning of August and the most for 1935 to date. Since then, at least three more stacks have resumed. A year ago blast furnace activity was tumbling precipitately. For 1935 to Sept. 1, pig iron output totals 13,110,056 tons, against 12,141,339 a year ago.

Relatively, new business in pig iron is a little brisker than in finished steel. Especially in the Chicago district are melters anticipating their iron needs farther ahead. There, also, commitments for coke have an anticipatory tone.

Better jobber demand for wire is noted. Warehouses expect to apply quantity differentials in line with those adopted by mills on hot-rolled products. Gary has now been made a base for strip steel.

The iron and steel composite of STEEL moved up 1 cent last week to $32.79, the scrap index was up 4 cents to $12.41, while the recent adjustment in wire nails put the finished steel composite down 40 cents to $53.70.

COMPOSITE MARKET AVERAGES

	Sept. 7	Aug. 31	Aug. 24	One Month Ago Aug., 1935	Three Months Ago June, 1935	One Year Ago Sept., 1934	Five Years Ago Sept., 1930
Iron and Steel	$32.79	$32.78	$32.72	$32.68	$32.42	$32.15	$32.76
Finished Steel	53.70	54.10	54.00	54.02	54.00	54.00	50.87
Steelworks Scrap	12.41	12.37	12.33	12.05	10.45	9.45	12.81

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Sept. 7 1935	Aug. 1935	June 1935	Sept. 1934
Steel bars, Pittsburgh	1.85c	1.80	1.80	1.80
Steel bars, Chicago	1.85	1.85	1.85	1.85
Steel bars, Philadelphia	2.11	2.11	2.11	2.09
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.80
Shapes, Philadelphia	2.01½	2.01½	2.01½	2.00½
Shapes, Chicago	1.85	1.85	1.85	1.85
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Philadelphia	2.00	1.99	1.99	1.98½
Tank plates, Chicago	1.85	1.85	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.40
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.10
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.55
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.20
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.40	2.55	2.60	2.60

Semifinished Material

	Sept. 7 1935	Aug. 1935	June 1935	Sept. 1934
Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$28.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	28.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

Pig Iron

	Sept. 7 1935	Aug. 1935	June 1935	Sept. 1934
Bessemer, del. Pittsburgh	$19.81	$19.81	$19.81	$19.76
Basic, Valley	18.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	19.76	19.81	19.81	19.76
No. 2 foundry, del. Pittsburgh	19.31	19.31	19.31	19.26
No. 2, foundry, Chicago	18.50	18.50	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	20.68	20.68	20.68	20.63
Malleable, Valley	18.50	18.50	18.50	18.50
Malleable, Chicago	18.50	18.50	18.50	18.50
Lake Superior charcoal, del. Chi.	24.25	24.25	24.25	24.04
Ferromanganese, del. Pittsburgh	90.13	90.13	90.13	89.79
Gray forge, del. Pittsburgh	18.67	18.67	18.67	18.88

Scrap

	Sept. 7 1935	Aug. 1935	June 1935	Sept. 1934
Heavy melting steel, Pittsburgh	$14.25	$13.25	$12.25	$10.75
Heavy melt. steel, No. 2, east. Pa.	11.25	10.50	9.30	8.00
Heavy melting steel, Chicago	12.50	12.35	10.25	8.65
Rails for rolling, Chicago	12.50	13.65	11.25	10.05
Railroad steel specialties, Chicago	13.75	13.55	11.75	9.80

Coke

	Sept. 7 1935	Aug. 1935	June 1935	Sept. 1934
Connellsville, furnace, ovens	$3.25	$3.25	$3.50	$3.60
Connellsville, foundry, ovens	4.00	4.00	4.60	4.60
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c
Gary, No. 10	2.60c
Gary, No. 20	3.20c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.09c
Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.01½c
New York, del.	2.06½c
Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

(Base, 10 to 25 tons)

*Pittsburgh	1.85c
*Chicago or Gary	1.90c
*Duluth	2.00c
*Birmingham	2.00c
*Cleveland	1.90c
*Buffalo	1.95c
*Detroit, delivered	2.00c
*Pacific ports, f.o.b. cars, dock	2.40c
*Philadelphia, del.	2.16c
*Boston, delivered	2.27c
*New York, del.	2.20c
*Pitts., forg. qual.	2.10c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.91c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight carloads; 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.	
Standard wire nails	$2.40
Cement coated nails	2.40
Galvanized nails, 15 gage and coarser	4.40
do. finer than 15 gage	4.90

(Per pound)

Polished staples	3.10c
Galvanized fence staples	3.35c
Barbed wire, galv.	2.80c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$58.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.			0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.			1.05
5100 0.80-1.10 Cr.			0.45
5100 Cr. spring			base
6100 bars			1.20
6100 spring			0.70
Cr., Ni., Van.			1.50
Carbon Van.			0.95
9250	Carbon base plus extras		

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅞-in.	
Pittsburgh	1.85c
Chicago or Gary	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop,	
Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip,	
Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70 off

Hexagon Cap Screws

Milled	85-10 off
Upset, 1-in., smaller	87½ off

Square Head Set Screws

Upset, 1-in., smaller	80 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935 card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.67
Duluth	31.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.	35.00
Forging, Duluth	37.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.25- 3.40
Connellsville, fdry.	4.00- 4.10
Connel. prem. fdry.	5.00- 5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.00
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	30.00c
Commercial xylol	30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	4.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.08	.....	18.96	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm.	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O.	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem	20.99	21.49	.....	.....
Philadelphia from Birmingham	19.93	.....	19.1	.....
Philadelphia from Swedeland, Pa.	20.31	20.81	19.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	20.75	20.75	20.25	20.25

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.25
		Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional; each unit over 3%, $1 per ton additional.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality.

Pa., Ill., Md., Mo.	$45.00
Alabama, Ga., Ky.,	$40.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Ga., Ala.	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	45.00
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.50

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Sept. 2	Holiday										
Sept. 3	8.50	8.62½	8.00	48.85	48.00	4.35	4.20	4.60	*19.00	13.00	35.00
Sept. 4	8.50	8.62½	8.00	48.50	47.70	4.35	4.20	4.60	*19.00	13.00	35.00
Sept. 5	8.50	8.62½	8.10	48.70	47.85	4.35	4.20	4.60	*19.00	13.00	35.00
Sept. 6	8.50	8.62½	8.10	48.50	47.75	4.35	4.20	4.60	*19.00	13.00	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.00
Copper, hot rolled	15.50
Lead cut to jobbers	8.00
Zinc, 100-lb. base	9.50
Tubes	
High yellow brass	15.75
Seamless copper	15.75
Rods	
High yellow brass	12.50
Copper, hot rolled	12.75
Anodes	
Copper untrimmed	13.25
Wire	
Yellow brass (high)	14.50

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	5.00- 5.25
Cleveland	5.37½-5.62½
*Chicago	5.25- 5.50
St. Louis	5.25- 5.50
Heavy Copper and Wire	
New York, No. 1	6.50- 6.75
*Chicago, No. 1	6.37½-6.62½
Cleveland	5.75- 6.00
St. Louis, No. 1	6.50- 6.75
Light Copper	
New York	5.25- 5.50
*Chicago	4.75- 5.00
Cleveland	5.00- 5.25
St. Louis	5.25- 5.50
Light Brass	
*Chicago	2.87½-3.12½
Cleveland	2.62½-2.87½
St. Louis	2.75- 3.00
Lead	
New York	3.25- 3.37½
Cleveland	3.15- 3.40
Chicago	3.12½-3.37½
St. Louis	3.40- 3.50
Zinc	
New York	2.00- 2.25
Cleveland	2.25- 2.50
St. Louis	2.65- 2.75
Aluminum	
Borings, Cleveland	7.50- 8.00
Mixed, cast, Clev.	12.50-12.75
*Mixed, cast, St. L.	12.50-13.00
Clips, soft, Cleve.	14.00-14.50
SECONDARY METALS	
Brass ingot, 85-5-5-5	8.50
*Stand. No. 12 alum.	16.50-16.75

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.50
Boston, dock, expt.	8.75- 9.00
Boston, domestic	7.25- 7.50
Buffalo, No. 1	11.75-12.25
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.25-12.75
Cleveland, No. 1	12.00-12.50
Cleveland, No. 2	11.00-11.50
Detroit, No. 1	9.50-10.00
Detroit, No. 2	8.50- 9.00
Eastern Pa., No. 1	12.00
Eastern Pa., No. 2	11.00-11.25
Federal, Ill.	9.00- 9.25
Granite City, R. R.	9.50- 10.00
Granite City, No. 2	8.00- 9.00
N. Y., deal, No. 2	7.50
N. Y., deal, barge	8.50- 8.75
Pitts., No. 1 (R. R.)	14.00-14.50
Pitts., No. 1 (dlr.)	13.00-13.50
Pittsburgh, No. 2	12.00-12.50
St. Louis	8.00- 8.50
Valleys, No. 1	13.00-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.50-11.00
Chicago, factory	11.50 12.00
Chicago, dealer	10.25-10.75
Cleveland	11.00-11.50
Detroit	10.00-10.50
E. Pa., new mat.	11.50-12.00
Pittsburgh	13.00-13.50
St. Louis	6.25- 6.75
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	7.50- 8.00
Cincinnati, del.	7.00- 7.50
Cleveland	9.50-10.00
Pittsburgh	12.00-12.50
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	6.50- 7.00
Detroit	5.00- 5.50
St. Louis	4.75- 5.25

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	14.00-14.50
Chicago (3 ft.)	14.00-14.50
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	12.00-12.50
Detroit	11.50-12.00
Pitts., open-hearth, 3 ft. and less	15.00-15.50
St. Louis, 2 ft.&less	13.00-13.50

STEEL RAILS, SCRAP

Boston	7.50- 7.75
Chicago	12.25-12.75
Pittsburgh	14.00-14.50
St. Louis	11.25-11.75
Buffalo	11.75-12.25

STOVE PLATE

Birmingham	5.75- 6.00
Boston, dealers	3.50- 3.75
Buffalo	10.00-10.50
Buffalo	10.25-10.75
Cincinnati, dealers	6.50- 7.00
Detroit, net	7.00- 7.50
Eastern Pa.	9.50
N. Y., deal, fdry.	6.00
St. Louis	8.00- 8.50

COUPLERS, SPRINGS

Buffalo	13.50-14.00
Chicago, springs	13.50-14.00
Eastern Pa.	13.50
Pittsburgh	15.00-15.50
St Louis	12.00-12.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	11.00-11.50

RAILROAD SPECIALTIES

Chicago	13.50-14.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	13.50-14.00
Cleveland, billet, bloom crops	14.50-15.00
Eastern Pa., crops	14.50-15.50
Pittsburgh, billet, bloom crops	15.50-16.00
Pittsburgh, sheet bar crops	14.00-14.50

FROGS, SWITCHES

Chicago	12.25-12.75
St. Louis, cut	11.25-11.75

SHOVELING STEEL

Chicago	12.25-12.75
Federal, Ill.	9.15- 9.50
Granite City, Ill.	8.00- 8.50

RAILROAD WROUGHT

Birmingham	8.00- 8.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	10.50-11.00
Buffalo, No. 2	11.75-12.25
Chicago, No. 1, net	9.50-10.00
Chicago, No. 2	12.25-12.75
Cincinnati, No. 2	9.50-10.00
Eastern Pa.	12.00
N. Y., No. 1, deal	9.50-10.00
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	9.25- 9.75

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	10.00
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	11.00-11.50
Cinci., No. 1, deal	7.00- 7.50
Cincinnati, No. 2	4.00- 4.50
Cleveland, No. 2	7.75- 8.25
Detroit, No. 1, new	8.50- 9.00
Valleys, new, No. 1	12.25-12.75

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	3.25- 3.50
Buffalo	5.25- 5.75
Chicago	6.50- 7.00
Cincinnati, dealers	5.00- 5.50
Cleveland	7.75- 8.25
Detroit	5.25- 5.75
Eastern Pa.	7.50
New York, dealers	3.75- 4.00
Pittsburgh	9.50-10.00
St. Louis	2.25- 2.75
Valleys	8.50- 9.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	2.50- 2.75
Buffalo	7.00- 7.50
Cincinnati, dealers	5.00- 5.50
Cleveland	7.75- 8.25
Detroit	6.00- 6.50
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	7.00- 8.00

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	7.00- 7.50
Chicago	6.00- 6.50
Cincinnati, dealers	5.00- 5.50
Cleveland	7.75- 8.25
Detroit	6.00- 6.50
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	2.50- 3.00

PIPE AND FLUES

Cincinnati, dealers	5.50- 6.00

RAILROAD GRATE BARS

Buffalo	8.50- 9.00
Chicago, net	7.50- 8.00
Cincinnati	4.50- 5.00
Eastern Pa.	9.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.75- 6.00
Buffalo	10.50-11.00
Cleveland	9.50-10.00
Detroit	8.00- 8.50
Pittsburgh	12.00-12.50

FORGE SCRAP

Boston, dealers	4.50
Chicago, heavy	13.00-13.50
Eastern Pa.	11.50-12.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	10.50-11.00
Chicago, elec. fur.	12.00-12.50
Cleveland	7.00- 7.50
Eastern Pa.	9.50
St. Louis	7.50- 8.00

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.00-10.50
Buffalo	13.50-14.00
Chicago, net	14.25-14.75
Eastern Pa.	17.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	12.50-12.75
Eastern Pa.	17.50
New York, dealers	13.25-13.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00-10.00
Boston, iron deal	6.00- 6.25
Buffalo, iron	11.00-11.50
Buffalo, steel	13.50-14.00
Chicago, iron	12.50-13.00
Chicago, rolled steel	13.50-14.00
Cincinnati, iron	9.50-10.00
Eastern Pa., iron	12.00
Eastern Pa., steel	14.50-15.00
Pittsburgh, iron	13.00-13.50
Pittsburgh, steel	15.00-15.50
St. Louis, iron	9.75-10.25
St. Louis, steel	12.00-12.50

NO. 1 CAST SCRAP

Birmingham	8.50- 9.50
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	11.75-12.25
Buffalo, mach.	12.50-13.00
Chicago, agri. net	9.50-10.00
Chicago, auto	10.50-11.00
Chicago, mach. net	11.00-11.50
Chicago, railr'd net	10.50-11.00
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	12.25-12.75
Detroit, net	10.00-10.50
Eastern Pa., cupola	12.00
E. Pa., mixed yard	10.50
Pittsburgh, cupola	14.00-14.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	9.50-10.00
St. L., No. 1 mach.	10.00-10.50

HEAVY CAST

Boston, del.	5.50- 5.75
Buffalo, break.	10.00-10.50
Cleveland, break.	10.00
Detroit, No. 1, mach. net	10.50-11.00
Detroit, break.	8.50- 9.00
Detroit, auto net	10.75-11.25
Eastern Pa.	11.00-11.50
N. Y., break. deal	6.75- 7.25
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	10.50-11.00
Boston, consum.	12.00-12.50
Buffalo	13.25-13.75
Chicago, R. R.	14.50-15.00
Cincinnati, agri. del.	9.50-10.00
Cleveland, rail	14.50-15.00
Detroit, auto	11.50-12.00
St. Louis, R. R.	12.00-12.50
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.50-11.00
Boston, dealers	8.00- 8.50
Buffalo	11.75-12.25
Chicago	13.50-14.00
Eastern Pa.	12.50-13.00
New York, dealer	10.50-11.00
St. Louis	12.00-12.50

LOCOMOTIVE TIRES

Chicago (cut)	13.50-14.00
St. Louis, No. 1	11.75-12.25

LOW PHOS. PUNCHINGS

Buffalo	13.50-14.00
Chicago	14.50-15.00
Eastern Pa.	14.00-14.50
Pittsburgh (heavy)	15.00-15.50
Pittsburgh (light)	14.00-14.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00-10.50
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.50
Tungsten, spot sh. ton unit, duty pd.	$15.50-16.00
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.00

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.95c
Boston††	3.00c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.17c
Cleveland	2.95c
Detroit	3.04c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.26c
Pittsburgh (h)	2.90c
Philadelphia*	2.93c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.20c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.05c
Chicago	2.75c
Cincinnati	3.17c
New York‡(d)	3.36c
Philadelphia*	2.93c
St. Louis	3.20c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.25c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	3.00c
Boston††	3.19c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland	3.31c
Detroit	3.42c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.98c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	3.00c
Boston††	3.21c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.42c
Cleveland, ¼-in. and over	3.31c
Detroit	3.42c
Detroit, ⅜-in.	3.65 c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.98c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.45c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.22c
Cleveland	3.11c
Det., 8-10 ga.	3.14c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.31c
Portland	3.75c
Philadelphia*	3.08c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.60c
Boston (g)	3.95c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.07c
Cleveland	3.91c
Detroit	3.94c
Los Angeles	4.35c
Milwaukee	3.96c
New Orleans	4.50c
New York	3.89c
Philadelphia*†	3.60c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.10c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.30c
Buffalo	4.00c
Boston (g)	4.65c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.72c
Cleveland	4.61c
Detroit	4.72c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.30c
Pitts** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.65c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.20c
Boston††	3.30c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.47c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.39c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.56c
Philadelphia	3.18c
Pittsburgh (h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.55c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.30c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.47c
Det., No. 14 and lighter	3.39c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.56c
Philadelphia	3.43c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.55c
St. Paul	3.75c
COLD FIN. STEEL	
Baltimore (c)	3.58c
Boston	3.75c-3.90c
Buffalo (h)	3.40c
Chattanooga*	3.98c
Chicago (h)	3.35c
Cincinnati	3.57c
Cleveland (h)	3.35c
Detroit	3.49c
Los Ang.(f) (d)	5.85c
Milwaukee	3.46c
New Orleans	4.15c
New York	3.81c-4.31c
Philadelphia	3.61c
Pittsburgh	3.20c
Portland (f) (d)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.60c
St. Paul	3.05c
Tulsa	4.50c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.44c
Cleveland (b)	3.20c
Detroit	3.33c
New York	3.36c
St. Louis	3.45c
TOOL STEELS	
(Applying on or east of Mississippi river; west of Mississippi 1c up)	Base
High speed	67c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c
Uniform extras apply	
BOLTS AND NUTS	
(100 pounds or over)	Discount
Chicago (a)	70
Cleveland	70
Detroit	70–5
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Sept. 5

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.47 3 2 6	$13.99	1 15 0
Basic bessemer	15.47 3 2 6*	12.91	1 12 0
Hematite, Phos. .03-.05	16.21 3 5 6	.....	.....
SEMIFINISHED STEEL			
Billets	$27.23 5 10 0	$18.98	2 7 0
Wire rods, No. 5 gage	42.08 8 10 0	36.38	4 10 0
FINISHED STEEL			
Standard rails	38.36 7 15 0	$36.34	5 10 0
Merchant bars	1.66c 7 10 0	1.14c to 1.19c	3 2 6 to 3 5 0
Structural shapes	1.65c 7 7 6	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.77c 8 0 0	1.54c	4 5 0
Sheets, black, 24 gage or 0.5 mm.	2.04c 9 5 0	2.12c	5 16 0††
Sheets, gal., 24 gage, corr.	2.44c 11 5 0	3.19c	8 15 0
Bands and strips	1.88c 8 10 0	1.45c	4 0 0
Plain wire, base	2.04c 9 5 0	1.85c	5 7 6
Galvanized wire, base	2.38c 10 15 0	2.28c to 2.32c	6 5 6 to 6 7 6
Wire nails, base	2.65c 12 0 0	2.10c	5 15 0
Tin plate, box 108 lbs.	$4.46 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.71 3 7 6(a)	$17.16	260	$12.43	370	$25.35 63
Basic bessemer pig iron	17.33 3 10 0(a)*	12.54	190	11.09	330	27.96 (b) 69.50
Furnace coke	4.08 0 16 6	6.27	95	3.86	115	7.64 19
Billets	27.23 5 10 0	28.38	430	18.14	540	38.83 96.50
Standard rails	1.82c 8 5 0	2.08c	694	1.65c	1,100	2.42c 132
Merchant bars	1.90c 8 12 0	1.68c	560	.90c	600	2.01c 110
Structural shapes	1.93c 8 15 0	1.65c	550	.90c	600	1.97c 107.50
Plates, †¼-in. or 5 mm.	2.00c 9 1 3	2.10c	700	1.05c	700	2.32c 127
Sheets, black	2.43c 11 0 0§	1.86c	620‡	1.24c	825‡	2.64c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.87c 13 0 0	3.45c	1,150	2.25c	1,500	6.77c 370
Plain wire	2.04c 9 5 0	3.15c	1,050	1.73c	1,150	3.17c 173
Bands and strips	2.07c 9 7 0	1.95c	650	1.26c	840	2.32c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 64.70 per cent over paper sterling.

Bars

Bar Prices, Page 70

Pittsburgh—General acceptance of new quantity extras on carbon steel bars, announced ten days ago, has been experienced. Bar producers and consumers alike feel that the wholehearted application of this merchandising change will provide mutual benefit. The move so far applies only to carbon bars and has not affected the alloy bar market, which remains 2.45c, base, for all quantities. Buying by numerous small miscellaneous users of bars, and improved shipments to the automotive trade have accounted for the highest bar mill operations in this district in several months. One large bar producer had an exceedingly good schedule both on alloy and carbon grades at close to 50 per cent. The market on carbon steel bars is quoted 1.85c, base, Pittsburgh, for 10 to 25-ton lots where one grade or analysis is released for shipment to one destination at one time.

Chicago—Steel bar demand was reduced slightly by the recent holiday period, but consumption is well maintained and is increasing in some directions. Forging plants serving the automotive industry are busier in production of parts for new models and further gains in motor car requirements are in prospect for several weeks. Consumer interest in fourth quarter requirements is light and little tonnage has been booked for that period.

Boston—Commercial steel bar specifications for miscellaneous needs are sustained, with forging bars slightly more active. Alloy bars are moving well in small lots with some increase in needs for airplane parts. Industrial consumption, including machine products, is up slightly. Railroad releases are small and building projects give the market little support.

New York—Recently-announced quantity extras and deductions on steel bars are being well received, althouh jobbers as a group appear to be voicing most objection here. Larger resellers can easily take advantage of the new schedules, it is pointed out, but smaller warehouses find it more difficult. Some objection is also noted over stipulation for delivery at one destination.

Philadelphia—New quantity extras and deductions announced by the Carnegie Steel Co., to be effective Oct. 1, and adopted by other producers of commercial steel bars, is expected to stimulate bar business as a whole. Most bar consumers here are buyers of relatively small lots and see an advantage in buying at this time so as to save on the extras that go into effect next month. Meanwhile, the base is 1.80c, Pittsburgh, or 2.11c, Philadelphia.

Plates

Plate Prices, Page 70

Pittsburgh—American Bridge Co., Pittsburgh, has completed shop drawings covering the order it recently took from Mississippi Barge Line Co. for 30 barges, which will require 7500 tons of plates, and Carnegie Steel Co. is beginning to roll material for this order. It is expected the first of the 30 barges will be completed by early November and all 30 delivered by the spring of 1936. Purchase by American Oil Co., Baltimore, of one to four steel barges for use on the rivers in this district appears to be indefinitely delayed. However, a shortage of both tank and cargo box open-type steel barges is noted and forecasts some buying of barges in the near future which indirectly would reflect itself in plate tonnage. Several hundred

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SUPER-DIAMOND
for Permanence and Economy
"Battle decks" for Bridges—the daily grind and pound of traffic can proceed promptly, safely and "permanently" over "AW" Super-Diamond Floor Plates.
More and more engineers are realizing the value of this floor plate on new construction (and the replacement of old decks) because it saves wear and tear—and taxes.
Also made in the reliable Standard Diamond and Diamondette patterns in ferrous or non-ferrous metals.
SLIP-PROOF • OIL-PROOF
HEAT-PROOF • CRACK-PROOF • SAFE • SIGHTLY
SELF-DRAINING
SPLINTERLESS
ALAN WOOD STEEL CO.
ESTABLISHED
TRADE "A.W." MARK
1826
CONSHOHOCKEN, PA.
109 Years' Iron and Steel Making Experience
ALAN WOOD
STEEL COMPANY
CONSHOHOCKEN, PA.
Branch Offices: Philadelphia • New York • Seattle
Los Angeles • San Francisco • Memphis • Boston

tons of plates will be required for the construction of the United States dredge JEWETT, which will be a self-propelled 20-inch pipe line dredge on which bids will be opened Oct. 4 by the Louisville district engineers. About 400 tons of ½-inch plates will be bid to Kansas City army engineers soon for 400 pieces of 28-inch welded pipe for shipment to the Fort Peck dam, Montana.

Chicago — Plate orders usually cover only small individual lots, with the largest tonnages still being taken by structural fabricators. Several thousand tons will be required for roller gates for Mississippi river dams, but work on these units in most instances has not been started. Operations at railroad shops continue light, while equipment builders are placing little new business.

Boston—Inquiry for large tanks is slow but orders for miscellaneous uses holds current volume of shipments to the recent rate. Lacking backlogs, most shop fabricators have considerable immediate work on hand and are buying as needed. There is good demand for small tank heads. Shipbuilding buying in the near future is an encouraging factor and plates for welded machinery are a trifle more active. There is no inquiry for large pipe.

New York—A fairly good plate tonnage is going into domestic fuel storage tanks, and structural demands are somewhat better. A light tonnage will be required for repairs for 500 hopper cars for the Cambria & Indiana at the Avis, Pa., shops of the New York Central. Repair work on another lot of 500 cars may be undertaken later. Magor Corp., New York, has covered on steel for construction of 100 gondolas for the Grand Trunk Western.

Philadelphia — Plate tonnage in this district has been light since the award of several thousand tons by the Sun Shipbuilding Co. for the two tankers for the Gulf Refining Co., New York. It is understood this tonnage was divided principally between two producers, one in this district and one in the Pittsburgh area.

San Francisco—The only plate letting of size involved 370 tons for a penstock for the Seminole dam, Casper, Wyo., placed with an unnamed interest. Bids have just been opened on 4500 tons for the Ogden Canyon pipe line, Ogden, Utah, and on 500 tons for water stops for the metropolitan water district, Los Angeles. Torrance, Calif., will shortly be in the market for 195 tons for a water improvement system.

Seattle—Demand for light plates for tank and repair work, which has been active for a month, has declined. Everett, Wash., opened bids Sept. 3 for a pipe line extension to the Weyerhaeuser pulp plant, involving 200 tons of ¼ and 5/16-inch plates. Specifications are not yet out for the Tacoma water pipe extension requiring about 1800 tons.

Contracts Placed

5550 tons, approximately, two tankers for Gulf Refining Co., New York, placed by the Sun Shipbuilding Co., Chester, Pa., the principal portion understood to have been divided between a producer in eastern Pennsylvania and another in the Pittsburgh district; shapes and bars, bringing the total up to around 8000 tons, also are reported as placed principally with these two interests.

370 tons, penstock, Seminole dam, Casper, Wyo., to unnamed interest.

205 tons, tanks, Socony-Vacuum Co., Ohio, to Pittsburgh Bridge & Iron Co., Pittsburgh.

Unstated tonnage, 100 beer storage tanks for Stroh Brewing Co., Detroit, to A. O. Smith Corp., Milwaukee.

Contracts Pending

4500 tons, 36 to 48-inch welded steel pipe, Ogden canyon pipe line, Ogden, Utah; bids opened.

500 tons, water stops, specification 119, metropolitan water district, Los Angeles; bids opened.

400 tons, 400 pieces of welded pipe, each 12 feet long and 28 inches diameter, ½-inch plates, Fort Peck dam dredges; bids soon by Kansas City army engineers.

200 tons, ¼ and ⅝-inch pipe, for water line extension, Everett, Wash.; bids in.

195 tons, water system improvement project, Torrance, Calif; bids soon.

119 tons, bureau of supplies and accounts, navy department, Washington, including 63 tons for Puget Sound, Wash., bids Sept. 13, and 56 tons for Norfolk, Va.; bids Sept. 10.

Unstated tonnage, United States self-propelled 20-inch pipe line dredge JEWETT; bids Oct. 4 to Louisville, Ky., engineers.

Sheets

Sheet Prices, Page 70

Pittsburgh—Sheet mill operations were interrupted slightly last week by the Labor day holiday, but no shrinkage was evident in incoming specifications, which are as strong as in early August. Production of black sheets is around 70 per cent, followed by galvanized at 69 per cent and full finished grades averaging 64 per cent. Business of jobbing mills has shown an advanced tone and operations are at 50-55 per cent. The sheet market is steady and producers are quoting 2.40c, Pittsburgh, on black sheets, 1.85c on heavy hot-rolled and 3.10c on galvanized. In the full finished grades both 10 gage cold-rolled and enameling stock are 2.50c, base, 20 gage cold-rolled is 3.95c, and 20-gage enameling stock, 3.10c, Pittsburgh.

Cleveland—Northern Ohio sheet mills continue to make shipments in encouragingly increasing tonnages, especially to auto partsmakers. The new quantity extras on galvanized formed and painted roofing are being accepted generally. Orders for fourth quarter delivery are being placed on mill books at unchanged prices.

Chicago—Sheet demand is moderately less active, from miscellaneous consumers as well as from the automotive industry. Shipments remain heavy, however, and a fairly steady rate of consumption is in prospect for the next 30 days, with a rising tendency in automotive needs anticipated for October. Some business is being placed for October delivery but fourth quarter contracting generally is absent.

Boston—Sheet buying holds, but except to a few consumers of blue annealed for small tanks, carload shipments are not numerous. Miscellaneous demand is steady with a slight improvement in galvanized. Special finished sheets in small lots are fairly active. Slightly heavier selling by jobbers in some districts is reflected in improvement in their specifications.

New York—With jobber differentials on galvanized sheets being eliminated Oct. 1 the logical tendency would be for resellers to stock. However, due to highly unsettled retail prices jobbers are moving slowly on assumption there is no use stocking heavily if their selling prices will continue to net them little profit. Producers, nevertheless, expect some anticipatory buying by jobbers this month. Sheet business in other grades shows signs of further improvement.

Philadelphia—Sheet sellers have opened books for fourth quarter, with no change in base prices and the most important revision being elimination of jobber differentials on galvanized sheet, effective Oct. 1. Following the Labor day holiday, business has been improving slowly.

Buffalo—Sheet mills in this district continue to operate at 50 per cent of capacity with no immediate change in sight.

Cincinnati—Bookings by district sheet mills are heavy, close to 80 per cent of capacity, with production below this rate. Specifications from automobile manufacturers show only slight improvement. Buying for a broad miscellaneous demand is active. Prices are firm.

St. Louis—Producers and distributors of steel sheets report steady to moderately expanding demand. While interest still centers in lighter gages, there has been a better actual demand for the heavier.

Birmingham, Ala. — Sheet mills are working actively and shipments are steady, smaller consumers of galvanized corrugated sheets having to wait three weeks in some instances. Some export business is reported.

Transportation

Track Material Prices, Page 71

Buying of freight cars continues slack, two orders for 100 each making the total of 200 placed with builders in August. The total for eight months this year is 7033, compared with 23,383 in the corresponding period of 1934. Other comparisons are found in the following tabulation:

	1935	1934	1933	1932
Jan.	24	152	3	159
Feb.	806	19,725	0	35
March	0	30	5	105
April	350	800	50	0
May	2	717	8	60
June	5,151	1,835	500	0
July	500	19	306	25
Aug.	200	105	202	5
8 Mo.	7,033	23,383	1,074	449
Sept.		7	23	1,298
Oct.		75	514	0
Nov.		254	533	2
Dec.		110	316	50
Total		23,829	2,460	1,739

With governmental aid Canadian railroads have placed a large number of cars with builders in the Dominion, the Canadian National distributing 1180 freight cars, 15 locomotives and eight snow plows, the Canadian Pacific 1120 freight cars.

The Pennsylvania will open bids Sept. 17 under the Clayton act for its quarterly miscellaneous requirements of iron and steel, not to exceed 5000 tons. Norfolk & Western opened bids Sept. 4 on 100 wrought steel wheels and 3000 riser plates.

City council at Seattle has voted to substitute bus transportation for the service now given by the Seattle & Rainer Valley line, and probably will buy about 30 passenger buses.

Bids for two or four flat cars for use in construction of the Pickwick Landing dam will be taken at Knoxville, Tenn., by the Tennessee Valley authority Sept. 16. Bids will be taken for construction and delivery of the cars either by barge or rail.

Car Orders Placed

Canadian National railroad, 1180 freight cars, and eight snow plows, formally awarded as follows: 250 automobile cars and 80 sand cars, to the Canadian Car & Foundry Co. Ltd., Montreal Que.; 150 automobile cars and eight snow plows to the National Steel Car Corp. Ltd., Hamilton, Ont., 200 refrigerator cars and 250 gondola cars to the Eastern Car Co. Ltd., New Glasgow, N. S.; 250 refreigerator cars to its own shops.

Canadian Pacific, 1120 freight cars, of which 700 steel sheathed box cars went to the Canadian Car & Foundry Co. Ltd., Montreal, Que., and 170 composite drop-bottom gondolas, 150 refrigerator cars and 100 hopper cars went to the National Steel Car Corp. Ltd., Hamilton, Ont.

Chicago, Rock Island & Pacific, conversion of 320 box cars into a single deck stock cars, to the Ryan Car Co., Chicago.

Grand Trunk Western, 100 70-ton gondolas, to the Magor Car Corp., Passaic, N. J.

International Petroleum Co. Ltd., two tank cars for export, to American Car & Foundry Co., New York.

Norfolk & Western, 10 all-steel hopper cars, to its own shops, Roanoke, Va.

Locomotives Placed

Canadian National, 15 locomotives, 10 to Montreal Locomotive Works, Ltd., Montreal, Que.; and five to Canadian Locomotive Co. Ltd., Kingston, Ont.

Kingston Pocahontas Coal Co., Kingston, Pa., six mine locomotives, to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Car Orders Pending

California Dispatch Line, two 8000-gallon tank cars, pending.

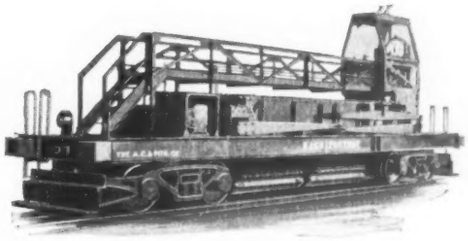
Tennessee Valley Authority, Knoxville, Tenn., two to four 40-ton flat cars; bids Sept. 16.

Semifinished

Semifinished Prices, Page 71

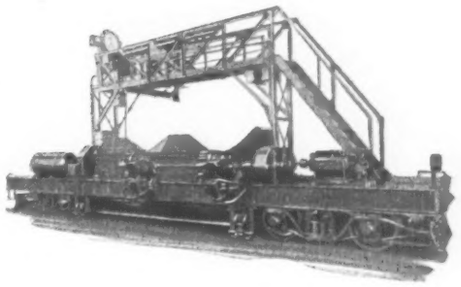
Producers of semifinished steel are issuing new price and extra cards

ATLAS SCALE CARS



20 Ton — Double Compartment Scale Car. Journals provided with self aligning anti-friction bearings. Equipped with Atlas Indicator and Recorder.

20 Ton Two Compartment Scale Car with Orr Bin Gate Operating Mechanism. Anti-friction bearings. Equipped with Atlas Indicating and Recording Mechanism.



Other Atlas Products

Gas-Electric and Diesel-Electric Locomotives—Car Pushers—Storage Battery Locomotives—Electrically Operated Industrial Cars—Scale Cars and Weighing Cars of all kinds — Ore Transfer Cars and Blast Furnace Charging Cars.

Coke Oven Equipment

Pushers and Levelers—Coal Charging Cars—Door Handling Machines — Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers *Manufacturers*

CLEVELAND, OHIO

covering forging billets, sheet bars, rerolling billets, etc., which incorporate the recently detailed changes in forging quality billets and certain minor extra changes in the price of sheet bars.

Full effect of the forging billet advance both in base prices and in extras as regards former base sizes has not been experienced as most large buyers are under contract at the former $32 price on the old 4 x 4-inch base. At Pittsburgh, the base price on sheet bars is quoted $28; on rerolling billets, $27; and on common wire rods, $38.

Pipe

Pipe Prices, Page 71

Pittsburgh—Steel pipe producers are interested in the recent report from Detroit that the Panhandle Eastern Pipe Line Co. will begin construction about Jan. 1, 1936, on a 300-mile extension of its pipeline from Dana, Ind., into Detroit. The pipe to be laid will be either 22 or 23-inch diameter and if 5/16-inch wall thickness were decided on, for example, the line would involve close to 60,000 tons. Orders for oil country goods are leading in demand for tubular products, followed by mechanical tubing and standard pipe. A few small feeders to existing pipelines have been placed recently, but the practice of reclaiming used pipe and re-laying lines has precluded any large projects from being actively considered.

Cleveland — Elyria, O., opened bids Thursday on a 30-inch water line to be constructed from 3 and a quarter miles north into the city. The original proposal asked for bids on cast pipe as base but noted also three alternates — electric welded, spiral or hammer welded. The low bidder is C. F. Lytle, Sioux City, Iowa, and it is understood that if he be given the contract the spiral steel pipe upon which he bid will be manufactured by the American Rolling Mill Co.

Chicago—The cast pipe market continues only moderately active, with orders and inquiries usually limited to small lots. The aggregate of pending tonnages, however, is fairly heavy and better bookings are in prospect for the next 30 to 60 days.

Boston—Confined mostly to small lots, cast pipe buying continues to lag, with few inquiries for more than 100 tons active. Requirements expected to develop under the public works program are slow to materialize and some communities have voted down loans for water line extensions. Utilities are buying little. Merchant steel pipe demand is steady and with some resellers fairly active for miscellaneous needs.

New York—Aggregate volume of small-lot inquiry for cast pipe tends upward although the total tonnage is not impressive. Donaldson Iron Works, Emaus, Pa., is low on 400 tons for this city, and approximately 235 tons for Massapequa, N. Y., probably will be bought this week through a contractor. Prices are steadier on recent open bidding.

Birmingham, Ala. — Numerous small-lot orders for pipe and fittings are being filled from warehouses but manufacturers are keeping their stock in various sections of the country up to normal. Pipe producers are operating at about 50 per cent.

San Francisco—Awards of cast pipe are limited to small lots of less than 100 tons. To date this year 23,989 tons have been booked as compared with 26,660 tons for the corresponding period in 1934. Bids have been opened on 6500 tons for the Ogden Canyon pipe line, Ogden, Utah, alternate having been taken on welded steel or reinforced concrete pipe.

Seattle—Considerable tonage is in prospect as soon as public funds are available to assist municipalities planning water system extensions and

Behind the Scenes with STEEL

Prosperity Note

TOTAL number of advertising pages in STEEL *for August increased* 16.50 *per cent over August last year. Total for the first half of* 1935 *was up* 20.7 *per cent over* 1934. *In the first half of the year, subscribers received a total of* 296 *more pages, advertising and editorial, than in the same period last year, even though there were only* 25 *issues, compared with* 26 *in* 1934.

* * *

Bell-Ringer

SOMEONE said to us the other day, "Well STEEL is a fine magazine but *Blanks'* magazine publishes 10 7/16 more pages in their editorial section every week, so I guess you get more for your money there, hay?"

We took him gently by the hand and replied, "My boy, which would you rather have for dinner tonight, one-half pound of tenderloin steak or five

pounds of broiled horseflesh? After all, more for your money, you know."

Quality, not quantity, is what rings the bell. We believe STEEL offers quality, plus selectivity, plus classification, plus interpretation. These four bell-ringers will lick quantity any day of the week.

We feel surer of this every time we receive a letter such as the one from a Pittsburgh friend who concludes by saying, "Each page of STEEL scintillates with history in the making, and we eagerly look forward to every issue."

* * *

More Orchids

HARD on the heels of these kind words comes a note from the secretary-treasurer of a New Orleans manufacturer of tractor cranes, hoists, derricks and trailers who says among other things: "We always keep the current issue of STEEL on our desk and always heartily recommend your publication to our friends and customers who see it there." Put him on the payroll, quick!

He further says that he noticed our comment (ha! a reader) in this column recently anent reprints and wonders whether we make reprints of our "New Equipment" section. Yes sir, we'll make reprints of anything you can get on a press, and our print shop has several giants down there ready to whip out a million or so reprints in a moment's notice. How many, please?

* * *

No Bed of Roses

LIFE, for editors, is certainly no bowl of cherries. "*As the Editor Views the News*" page in the Aug. 26 issue went to some length to decry governmental bureaucracy and waste. An indignant Indianapolis reader clipped the page out and sent it to us with the red-penciled notation: "Is this a political paper or a trade magazine. Phooey!"

In the same mail came a request for six extra copies of the page for another reader who wanted to send them to certain friends. We wish we could manage to introduce these two readers to each other. They ought to have a great time together.

But as regards politics, etc., there is an observation which strikes us as pertinent. As long as government sticks to government and stays out of business, then business and business papers should definitely steer clear of political discussion; but when government suddenly begins business-baiting and goes into business itself on a huge scale, then, partisan or no partisan, it's time for business papers to talk, and talk loudly.

* * *

In Re 5th Ultimo

WE'VE always wondered about that line appearing along the lower edge of most business stationery: "All agreements contingent upon strikes, accidents, delays and other causes beyond our control." Is that time-worn cliche still read with awe and trembling by prospective customers or do they now say, "Pooh, pooh, I'll bet that's what you tell all the girls"?

Maybe, just to be in style, we ought to print on the contents page some warning such as: "All statements made in this week's issue contingent upon strikes, accidents, delays and other causes beyond the editor's control." Won't somebody with a legal turn of mind please explain this clause to this most unworthy person, without too many whereas-es?

—SHRDLU

improvements. No specifications of importance are up for figures although some fair tonnages are pending in Idaho and Montana. Local turnover consists of small lots out of stock.

Cast Pipe Placed

950 tons, 48-inch, Bayonne, N. J., to Warren Foundry & Pipe Co., Phillipsburg, N. J.; Joseph L. Sigretto, New York, general contractor.
640 tons, 4, 6 and 8-inch, Public Service Corp., Newark, N. J., divided between United States Pipe & Foundry Co., Burlington, N. J., and R. D. Wood & Co., Florence, N. J.
340 tons, 12-inch and under, White Plains, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J.
100 tons, 6-inch, Panama, to McWane Cast Iron Pipe Co., New York.

Steel Pipe Placed

700 tons, 16-inch, river crossing at Concordia, Kans., for Natural Gas Pipe Line Co. of America, to Republic Steel Corp., Youngstown, O.
Unstated tonnage, 58,100 feet, mostly 1 and 2-inch galvanized standard, Panama, to Thomas Somerville Co., Washington; same bidder awarded 3000 feet, 6-inch and under, black steel pipe, same schedule.

Cast Pipe Pending

6500 tons, Ogden Canyon pipeline, Ogden, Utah; bids in.
600 tons, water system improvement, Torrance, Calif.; bids soon.
415 tons, 8 and 10-inch, bureau of supplies and accounts, navy department, Washington, for East and West coast yard; bids in.
400 tons, 20-inch, cement lined, department of purchase, New York; Donaldson Iron Works, Emaus, Pa., low.
252 tons, Minersville, Utah; bids in.
225 tons, 4 and 6-inch, Victor, Idaho; bids in.
200 tons, 2 to 6-inch, Bloomington, Idaho; bids in.

Steel Pipe Pending

80,000 tons, 24-inch, gas line from Rockville, Ind., to Detroit, for Panhandle Eastern Pipe Line Co.
Unstated tonnage, 3¼-mile water line to Elyria, O., C. F. Lytle, Sioux City, Iowa, is low bidder on spiral type, probably fabricated by American Rolling Mill Co.

Strip Steel

Strip Prices, Page 71

Pittsburgh—Barring interruption to trade by Labor day, last week showed the sixth weekly consecutive gain in the strip market in specifications and shipments. Operations of hot mills are now at better than 40 per cent, and a similar showing has been recorded in cold-rolled strip. Automobile manufacturers are issuing releases more freely and are now permitting prompt shipment against orders placed in August. The Pittsburgh bases of 1.85c on hot-rolled and 2.60c on cold-rolled strip steel are without change.

Chicago—Gary, Ind., has been added as a base for hot-rolled strip. Previously Chicago was the only local base. The market is unchanged at 1.95c, this applying to both points. Business is quieter, following heavy buying during late August. Consumers usually are ordering no farther ahead than October, little interest being shown in contracting for the entire fourth quarter. Shipments remain fairly heavy, with consumption steady in most directions. An increase in automotive needs is seen for next month.

Boston—Cold-rolled strip buying has accelerated at a rate slightly ahead of the recent gradual improvement in demand, incoming releases for miscellaneous stamping being heavier. Buying is for a wider range of industries with specifications for automotive partsmakers appearing. Prices are steady and unchanged at 2.80c, Worcester, for cold-rolled.

New York—Following a lapse around the Labor day holiday, strip specifications again are coming out

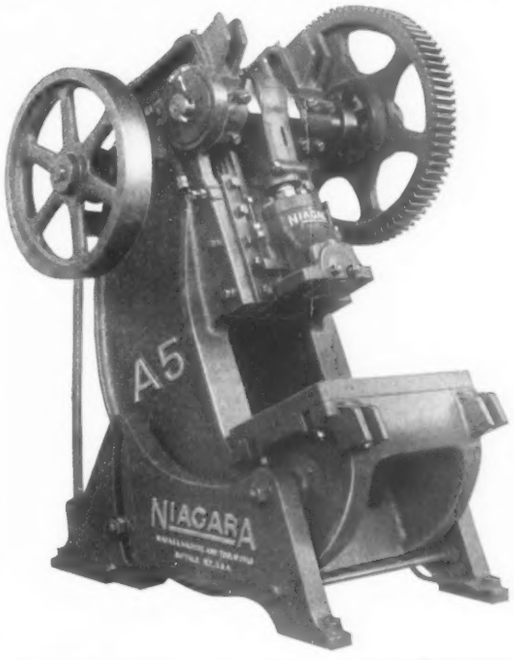
STEEL CASTING FRAME

is just ONE of the Many

Sensational Improvements

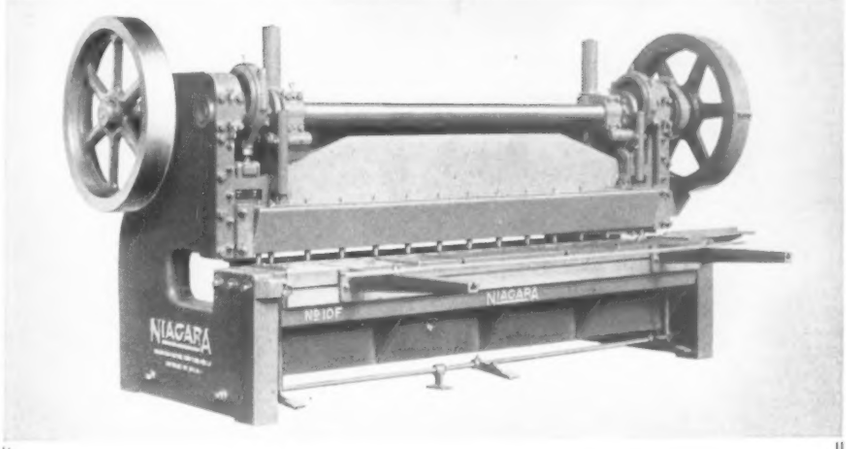
in these

NIAGARA PRESSES



6-Point Engagement Clutch
Triple "V" Gibs
Rigid Strong Slide
Breach Block Die Clamp
One Man Inclining Device
Timken Bearings in Back Shaft Assembly

Write for Bulletin 335



33,700 NIAGARA SHEARS

Have Met the Tests of TIME and SERVICE

Write for Bulletin 72-E Showing latest improvements.

NIAGARA MACHINE & TOOL WORKS

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General Motors Bldg., Detroit, Mich.

more freely, with sellers generally regarding the outlook for this fall as the most promising in several months. Prices have been reaffirmed for fourth quarter.

Philadelphia—With strip prices reaffirmed, sellers of strip are soliciting fourth quarter tonnage, although to date future buying interest has been dull. Hot strip is 1.85c, Pittsburgh, or 2.16c, Philadelphia, and cold strip, 2.60c, Pittsburgh, or 2.91c, Philadelphia.

Shapes

Structural Shape Prices, Page 70

New York—Structural steel inquiry is up slightly, new work on which bids are in including 1200 tons for buildings at Brooklyn college, and 700 tons for the Fisher Body building at Tarrytown, N. Y. More projects, generally taking small tonnages, are active under the public works program while close to 1200 tons is up for state bridges in New York and New Jersey.

Structural steel tonnage contracted for in July by the entire industry is estimated by the American Institute of Steel Construction Inc., New York, as 57,556 tons, or 24.6 per cent of the average of shipments 1928-31. In June, bookings were 122,393 tons. The total for seven months of 1935 is 575,463 tons. Deliveries only in July totaled 30,886 tons, deliveries and erections 26,180 tons, production 90,089 tons, and shipments 94,773 tons. Total of shipments in the first seven months is 599,392 tons. Tonnage available for fabrication in the next four months is 231,766 tons, and for fabrication thereafter 58,261 tons.

Pittsburgh—Award of the 7500-ton Homestead high level bridge, sponsored by the Allegheny County authority, is still held up and early closing officially on the contract is not promising. American Bridge Co., Pittsburgh, is low on the job. New structural inquiry includes a 1750-ton pier shed in New York for the Eastern Steamship Lines, 1000 tons for state highway bridges in Michigan, and smaller projects which are fewer in number. The structural fabricating trade is barely able to maintain 25 per cent operations and prospects are not encouraging. Plain structural shapes hold at 1.80c, base, Pittsburgh, with a degree of stability now noted in fabricated prices.

Chicago—Structural inquiries are heavier, with public work slightly more active. Several large bridges are pending in Illinois, including 2200 tons for a unit at Meredosia. The Torrence avenue bridge, Chicago, is expected to take about 3000 tons, but bids for the superstructure have yet to be asked.

Boston—Structural contracts are light, awards lacking tonnage. More postoffice projects are up for bids, most of them small. Pending bridge needs are light, including a 190-ton project at Millbury, Mass. Imports of structural steel in the Boston customs district during August were 204 tons, mostly from Belgium.

Philadelphia—Structural business has been devoid of important tonnages over the past week, although several, headed by the 2300-ton Archives building in Washington, are pending. Possibly the largest structural job up for bidding this week in this district is the marine terminal development for the South Jersey port commission, Camden, N. J., involving 1000 tons.

Buffalo—Inquiry for structural steel continues to improve as the result of fund allotments for bridge construction in flood areas and also for erection of public buildings. Fabricators predict the fourth quarter will be the best of the year.

Birmingham, Ala.—Structural steel fabricating shops are maintaining fair activity. Most contracts involve small tonnages. Virginia Bridge & Iron Co. has delivered 800 tons for the power-house at Norris dam. Heavy shapes for bridges in California and other West Coast points are moving steadily here.

San Francisco—While structural awards are not heavy, considerable new work is in sight. To date this year 75,361 tons have been booked, compared with 98,348 tons for the corresponding period in 1934. Bids have been taken on 3300 tons of sheet steel piling for the bulkhead at Government Island, Oakland, Calif.

Seattle—Structurals continue in best demand in this area. Plants report steady operations, much of their work being in lots of less than 100 tons. Awards this week totaled 650 tons. The largest tonnages pending are 1272 tons for the Seminole dam and 878 tons for the Alcova dam in

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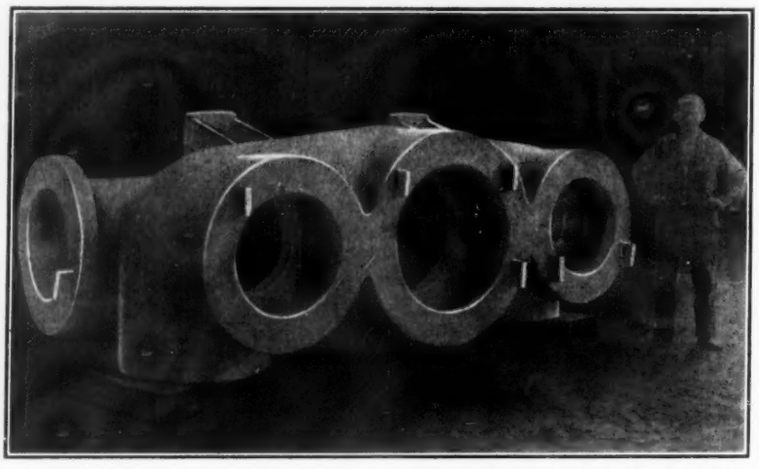

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Shape Awards Compared

	Tons
Week ended Sept. 7	15,746
Week ended Aug. 31	22,805
Week ended Aug. 24	13,808
This week, 1934	7,639
Weekly average, 1934	16,284
Weekly average, 1935	15,223
Weekly average, August	18,336
Total to date, 1934	624,675
Total to date, 1935	563,247

Wyoming. Department of commerce plans four 125-foot steel towers and a radio station near Helena, Mont.

Shape Contracts Placed

5800 tons, dam, Dubuque, Iowa, comprising 2800 tons shapes to R. C. Mahon & Co., Detroit, and 3000 tons sheet piling to Inland Steel Co., Chicago.

1500 tons, United States mint building, San Francisco, to Pacific Coast Steel Corp., San Francisco.

1250 tons, Bronx county jail, New York, to Harris Structural Steel Co., New York.

1050 tons, postoffice, Wilmington, Del., to Lehigh Structural Steel Co., Allentown, Pa.

771 tons, valves for Seminole dam, Casper, Wyo., to unnamed interest.

700 tons, airplane factory, Mines Field, Los Angeles, to Consolidated Steel Corp., Los Angeles.

501 tons, gates, Seminole dam, Casper, Wyo., to unnamed interest.

500 tons, bridge replacement, Watkins Glen, N. Y., to American Bridge Co., Pittsburgh.

450 tons, postoffice and customs house, San Pedro, Calif., to Pacific Coast Steel Corp., San Francisco.

410 tons, subway, Newark, N. J., for Pennsylvania railroad, to American Bridge Co., Pittsburgh.

350 tons, state bridge, Toutle river, Washington, to Wallace Bridge & Structural Steel Co., Seattle.

320 tons, bridge PWS-42, Barber county, Kansas, to Geo. C. Christopher & Son, Wichita, Kans.

300 tons, bridge, Columbian Falls, Mont., to McClintic-Marshall Corp., Bethlehem, Pa.

275 tons, state bridge, Cabell county, West Virginia, to Mt. Vernon Bridge Co., Mt. Vernon, O.

209 tons, state bridge over Pennsylvania-Reading-Seashore lines, Atlantic county, New Jersey, to Phoenix Bridge Co., Phoenixville, Pa., through Eastern Construction Co., Atlantic City, N. J.

180 tons, mill house, Pottsville, Pa., for Yeungling & Sons, to McClintic-Marshall Corp., Bethlehem, Pa.

165 tons, building, sewage plant, Cleveland, to McClintic-Marshall Corp., Bethlehem, Pa.

160 tons, assembly hall and school, Annadale, N. J., to Breen Iron Works.

160 tons, bridge, Vermillion county, Illinois, to Worden-Allen Co., Milwaukee.

150 tons, bus garage, Eastern Massachusetts Street Railway Co., Salem, Mass., to Boston Bridge Works Inc., Cambridge, Mass., contract being awarded direct by owner.

125 tons, state bridge in Chelan county, Washington, to Wisconsin Bridge & Iron Works, Milwaukee; Elliott & Co., Seattle, general contractor.

110 tons, Memorial church, Cincinnati, to Ingalls Iron Works, Verona, Pa.

105 tons, building, Ohio Oil Co., Findlay, O., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

105 tons, state highway bridge, Harlan county, Kentucky, to Vincennes Steel Co., Vincennes, Ind.

100 tons, plant addition, Northwest Portland Cement Co., Grotto, Wash., to Isaacson Iron Works, Seattle.

Shape Contracts Pending

3300 tons, piling, Government Island, Oakland, Calif.; bids in.

3000 tons, Torrence avenue bridge, Chicago, PWA project 9625-X.

2800 tons, dam at Rock Island, Ill.; Maxon Construction Co., Dayton, O.; low.

2200 tons, state bridge, Meredosia, Ill.; bids Sept. 20.

2100 tons, Lake of the Ozarks bridge, Missouri; bids this week.

2100 tons, Morgan-Pike county bridge, Illinois; bids Sept. 17.

1700 tons, pier shed 25, Eastern Steamship Co., New York.

1575 tons, sheet piling except for 225 tons, ocean terminal, Morehead City, N. C.; bids Oct. 1.

1200 tons, heating and gymnasium building, Brooklyn college, Brooklyn, N. Y.; E. Waters & Co., New York, low on bids Sept. 4.

1000 tons, state highway bridges, scattered locations, Michigan.

900 tons, bridge, Columbus Junction, Iowa.

878 tons, Alcova dam, Wyoming; W. E. Callahan and Gunther-Shirley Co., Los Angeles, general contractors.

700 tons, additional building, Chevrolet Motor Co., Tarrytown, N. Y. This is in addition to building recently placed.

600 tons, bullion depository, treasury department, Fort Knox, Ky.; Great Lakes Construction Co., Chicago, low.

500 tons, cranes, Carnegie Steel Co., Munhall, Pa.

450 tons, crib frames, Grand Coulee dam, Odair, Wash.

425 tons, alterations, Eagle Point bridge, near lock 11, Dubuque, Iowa; Worden-Allen Co., Milwaukee, low on general contract.

400 tons, tainter gates, Angeles, Tex.

400 tons, state highway bridges, New York; bids Sept. 24.

350 tons, hospital, Jamestown, N. Dak.

350 tons, bridge, Salinas, Calif.

350 tons, tunnel ribs, specification 121, metropolitan water district, Los Angeles; Consolidated Steel Corp., Los Angeles, low.

317 tons, Kiowa Creek state bridge, Adams county, Colorado; bids in.

300 tons, state bascule bridge, Bridgeton, N. J.

300 tons, sheet piling, Ford Motor Co., Detroit.

275 tons, health center, Brooklyn, N. Y.; bids Sept. 10.

255 tons, Marias River state bridge, Toole county, Montana; bids in.

250 tons, building, Owens-Illinois Glass Co., Streeter, Ill.

250 tons, postoffice, Winston-Salem, N. C.; bids Sept. 27.

250 tons, state bridge, Indiana.

250 tons, building, U. S. Playing Card Co., New Brunswick, N. J.

201 tons, Middle Bijou Creek state bridge, Adams county, Colorado; bids in.

200 tons, state highway bridge, Grangeville, Idaho.

200 tons, health center, East Harlem, New York; bids in.

200 tons, postal station O, New York bids Sept. 30.

200 tons, two state bridges, Blackstone river and over New York, New Haven & Hartford railroad, Millbury, Mass.; Arute Bros. Inc., Bridgewater, Mass., low on general contract; bids Sept. 3.

190 tons, health center, Astoria, N. Y.; bids in.

183 tons, five state bridges in Madison county, Montana; bids in.

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173 tons, three state bridges in Oregon; bids in.
150 tons, seaplane hangar and barracks, Charleston, S.C.; bids Sept. 27.
150 tons, state highway bridge, Paris, Wis.
125 tons, water system improvement project, Torrance, Calif.; bids soon.
120 tons, West Bijou Creek state bridge, Araphoe county, Colorado; bids in.
100 tons, shapes and bars, postoffice, Bristol, Conn.; Joseph Lasprogato, South Norwalk, Conn., low.
Unstated tonnage, 3-span state bridge, Glacier county, Montana; W. P. Roscoe Co., Billings, Mont., general contractor.
Unstated tonnage, trestle work and railroad, Fort Peck, Mont., dam; Morrison-Knudsen Co., Boise, Idaho, general contract.
Unstated tonnage, two 240-foot state spans, Idaho; bids in.
Unstated tonnage, six span, 541-foot state bridge, Toole county, Montana; Thomas Stanton, Great Falls, Mont., general contractor.
Unstated tonnage, $438,000 postal station, Philadelphia; bids Sept. 25.

Quicksilver

New York—A firmer undertone, following recent easiness, appears to be developing in quicksilver, but demand has been too quiet this week to afford an adequate test of prices. Small lots are quotably unchanged at $70 a flask, but sellers view round lots of 100 virgin flasks firmer at $69.50 a flask against $69 previously.

Reinforcing

Reinforcing Bar Prices, Page 71

San Francisco—The metropolitan water district, Los Angeles, has just placed what is believed to be the largest individual award of reinforcing steel bars in the history of the industry, 83,790 tons under specification 109. Truscon Steel Co., Blue Diamond Corp., Concrete Engineering Co., Soule Steel Co., Consolidated Steel Corp., Security Materials Co. and J. W. Black Co. participated in the award, which amounts to over half of the total bar tonnage hitherto placed throughout the country this year, according to STEEL's records.

Chicago—Pending business in reinforcing bars is accumulating and an increase in bookings is looked for soon. Awards of 700 tons for a dam at Dubuque, Iowa, has been made to Inland Steel Co. Fairly substantial tonnage is accumulating for various public projects, principally bridges, in Illinois.

Pittsburgh—Pittsburgh and other eastern reinforcing steel bar makers have received allocation on part of the tonnage of bars purchased by the Los Angeles metropolitan water district. On new billet bars, distributors continue to quote generally on the basis of 2.05c, Pittsburgh, for carload lots, straight lengths, and on rail steel the market on the same basis is 1.90c, Pittsburgh.

Boston—Reinforcing steel inquiry is slightly heavier, bids being in on approximately 450 tons for state highways and bridges, Connecticut and Massachusetts. Small-lot buying is slightly more active with indications of more reinforcing steel needed shortly on public works projects about to come out for bids.

New York—Reinforcing steel inquiry is the heaviest in several months, highway and bridge projects on which bids are in, or about to be closed, being supported by more new projects, including 325 tons for an automobile company building, Tarrytown, N. Y., and 195 tons for buildings at a Brooklyn, N. Y., college. Awards are light, but a spurt in buying is assured within the next two weeks when prices will undergo tests.

Philadelphia—S. J. Groves, Ridgefield, N. J., is low on the general contract for construction of a road in Burlington county, New Jersey, involving 300 tons of mesh. While the official price on billet steel bars, cut lengths, is 2.05c, Pittsburgh, or 2.36c, Philadelphia, the market is becoming increasingly unsettled.

Seattle—The market is spotty, most of the demand coming from public works. Business pending is not of large proportions but prospects are better as the WPA program proceeds. Local mills have fair tonnage on books but are barred from inland sections because of unfavorable freight rates.

Reinforcing Steel Awards

83,790 tons, metropolitan water district, Los Angeles, allocated as follows: 18,110 tons to Concrete Engineering Co., 17,950 tons to Truscon Steel Co., 17,950 tons to Blue Diamond Co., 17,780 tons to Soule Steel Co., and 4000 tons each to Consolidated Steel Co., Security Materials Co., and J. W. Black Co.
700 tons, dam, Dubuque, Iowa, to In-

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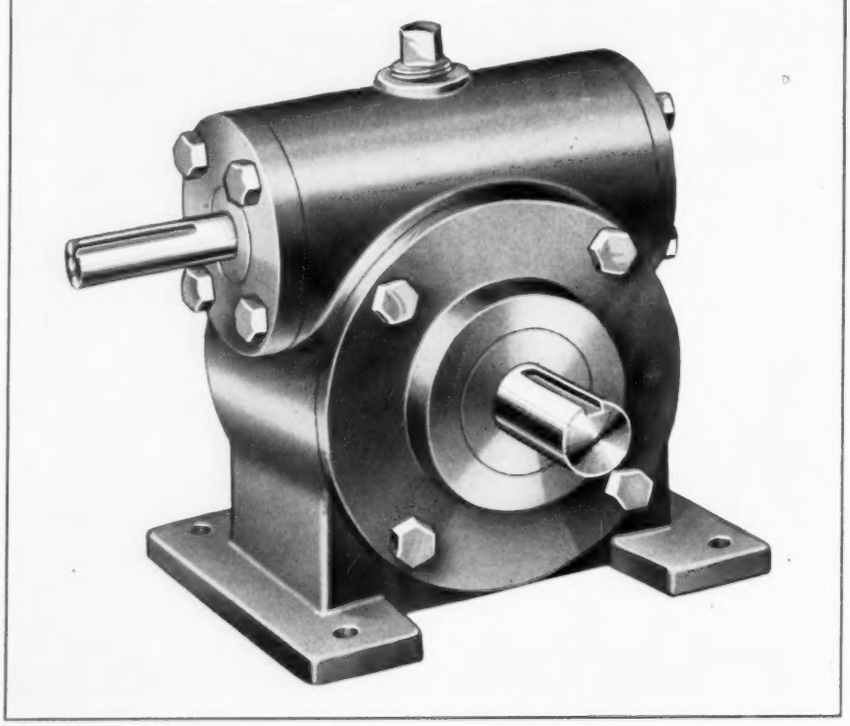

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Concrete Awards Compared

	Tons
Week ended Sept. 7	85,781
Week ended Aug. 31	4,037
Week ended Aug. 24	2,538
This week in 1934	1,300
Weekly average, 1934	4,084
Weekly average, 1935	6,466
Weekly average, August	3,829
Total to date, 1934	178,006
Total to date, 1935	239,245

land Steel Co., Chicago.

381 tons, specification 1768, water and power department, Los Angeles, to unnamed interest.

275 tons, University of Washington dormitory, Seattle, to Pacific Coast Steel Corp., Seattle; Sheble Construction Co., Seattle, general contractor.

175 tons, sewage disposal plant, Chicago Heights, Ill., to Calumet Steel Co., Chicago; in addition to 175 tons to Inland Steel Co., Chicago, reported last week .

125 tons, postoffice, Wilmington, Del., through Erwin & Leighton, Philadelphia, general contractor, to the American Steel Enginering Co., Philadelphia, for rolling at Buffalo.

115 tons, highway, Delilah road extension, including bridge over the Pennsylvania-Reading Seashore lines, Atlantic county, New Jersey, to Taylor-Davis Co., Philadelphia; Eastern Construction Co., Atlantic City, N. J., general contractor.

115 tons, highway, Newark, N. J., to Stulz-Sickles Co., Newark, through Thomas Gallo, New York.

105 tons, Kappock street bridge, Henry Hudson parkway, New York, to Concrete Steel Co., New York, through Doyle & Doyle Inc., Scarsdale, N. Y.

Reinforcing Steel Pending

5800 tons, highways and bridges, New York state; included in bids opening Sept. 4, 17, 24 and Oct. 1.

700 tons, grade crossings, Staten Island Rapid Transit Co., Tompkinsville and Stapleton, Staten Island, N. Y.; bids Sept. 20.

500 tons, relocation of Baltimore & Ohio railroad tracks, West Virginia.

350 tons, bridge, Benton Harbor, Mich.; Wisconsin Bridge & Iron Co., Milwaukee, low.

326 tons, metropolitan water district, Los Angeles; bids in.

325 tons, Fisher Body building, Chevrolet Motor Co., Tarrytown, N. Y.; bids Sept. 10.

320 tons, bridge, Klamath river, Oreg.; bids in.

300 tons, state highway and two bridges, latter over Blackstone river and New York, New Haven & Hartford railroad, Millbury, Mass.; Arute Bros. Inc., Bridgewater, Mass., low on general contract; bids Sept. 3.

300 tons, mesh, state road work, Burlington county, New Jersey; S. J. Groves, Ridgefield, N. J., low on general contract.

285 tons, bullion depository, treasury department, Fort Knox, Ky.; Great Lakes Construction Co., Chicago, low on general contract.

195 tons, heating and gymnasium building, Brooklyn college, Brooklyn, N. Y.; E. Waters & Co. New York, low on general contract.

Unstated tonnage, several concrete spans, state of Montana; Thomas Stanton, Great Falls, Mont., and W. P. Roscoe, Billings, Mont., general contractors.

Unstated tonnage, approaches, Fifth street bridge, Parkersburg, W. Va.; Fritz-Rumer Cooke Co., Columbus, O. general contractor; unstated tonnage also required for substructure; Porterfield-Binger Construction Co., Youngstown, O., general contractor.

Unstated tonnage, units No. 5 and No. 10, sewage development, Blue Plains, D. C.; John McShain, Philadelphia, low on general contract.

Unstated tonnage, approaches and substructure, Torrence avenue bridge, Chicago; bids to commissioner of public works, Sept. 18.

Wire

Wire Prices, Page 71

Pittsburgh — Jobbers are buying more freely for their wire product requirements, in some sections as a result of strong current demand and in other districts based on anticipated fall trade. Automotive parts buyers are a leading support to the manufacturing wire market and requirements of the miscellaneous trade appear to be improving. Standard wire nails are quoted $2.40, base, Pittsburgh, plain wire, 2.30c, and fence wire, 2.45c for annealed and 2.80c for galvanized. Spring wire continues at the former base of 2.90c, Pittsburgh, and fencing, $58 per base column.

Boston — Demand for specialties and manufacturers' wire continues brisk with buying of several other lines broadening, resulting in scattered increases in finishing operations. The limited number of carload and heavy tonnage buyers of merchant wire products in this district will result in few taking full advantage of the lower prices in quantity extra brackets for such goods. Incoming volume of cable orders, largely government contracts, has benefited most cable works in New England who share in the award of several thousand tons included in the navy opening of Aug. 13.

Washington—Momsen, Dunnegan, Ryan Co., El Paso, Tex., has been awarded 2820 spools of galvanized cattle-type barbed wire by the department of interior, delivery at Tucson, Ariz., at $8412.06, less freight allowance of $3191.51 from Duluth. The same company was awarded the contract for 98,800 steel fence posts for Tucson at $31,042.96, less freight allowance of $13,356.18, to be shipped from Duluth. Bids on the posts closed Aug. 10.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—The effect of cold weather in retarding crops is indirectly providing concern to tin plate manufacturers who are not obtaining releases as quickly as they anticipated. Barring, however, an early frost, heavier releases can still come through over the next 30 to 45 days. Nonetheless, it is true that finished stocks of tin plate in mill warehouses are still abnormally high. Therefore, for the time being tin plate producers are more concerned with moving

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stocks than in current rate of operations. The average through last week, however, was maintained at 55 per cent.

Tin plate producers will not announce their 1936 contract price much before November. Fourth quarter prices on tin mill black and long ternes will continue unchanged, finding 2.75c, base, Pittsburgh, the market on tin mill black and 3.40c on long ternes.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh—By inference and not formal announcement, pig iron producers are extending present prices for the balance of the year. On a Pittsburgh district furnace base, they are: $18.50 for foundry and malleable grades, $18 for basic, and $19 for bessemer. The market lacks large tonnage buying at present, although a leading nonintegrated steel mill here is taking barge loads of pig iron into its Pittsburgh district works on an as-needed basis. Requirements of some of the steel mill equipment builders are continuing to be served on a reciprocity basis and open market inquiries are scarce. Shenango Furnace Co. resumed operations in its Sharpsville, Pa., stack recently after a long bank.

Cleveland—Shipments are going forward in fair volume with expectations for increased tonnages later in the month. Significance is attached to the recent relighting of Globe Iron Co.'s stack at Jackson, O., idle since August last year. Demand for its products, bessemer ferrosilicon and silveries, continues to gain, indicating foundries using these products are increasing activities also. Prices are unchanged.

Chicago—Pig iron demand is heavier, consumers anticipating higher prices as well as increased operations by ordering for delivery over the balance of the year. Fourth quarter contracts currently are being taken at $18.50, furnace, for No. 2 foundry and malleable, but a higher price is regarded likely for next quarter. Shipments are heavier, reflecting an upturn in average foundry schedules.

Boston—Pig iron buying for fourth quarter shipment is fairly active. Spot shipments from stock, including foreign iron, are slightly more numerous to a broadening consumer front. Most of the larger textile machinery producers are well stocked, but the feeling prevails some volume will be forthcoming from these sources next quarter. Foreign stocks of iron, notably Dutch and Russian, are lower and the latter has sold under Dutch. Domestic prices are firm. In this customs district 967 tons were imported last month, all from British India.

New York—Pig iron sellers here are looking forward to improved business this fall. Threat of higher prices as a result of passage of the Guffey coal bill may lead as time goes on, to more forward buying than has been noted in many months. Some sellers are advising customers the actual application of this bill may lead to an increase of as much as 50 cents a ton in pig iron before the end of this year.

Philadelphia—Pig iron sellers look for a further gain in demand this month, although possibly not as substantial an improvement in point of percentage, at least, as in July and August, when increases in shipments for most leading sellers ranged from 25 to 35 per cent. Sellers have opened books for fourth quarter at unchanged prices.

Buffalo—Covering of fourth quarter needs has become general, producers here report. Shipments were off a triffle during the first week of this month, a normal development for the season. Producers have had little opportunity to accumulate tonnage for storage so far this quarter, the result being that comparatively little iron has moved by water for winter supplies. August deliveries were about 5 per cent in excess of those of July in this territory. Seven blast furnaces continue in operation here.

Cincinnati—Orders for fourth quarter, already booked, arouse predictions that demand will be better than during the third quarter. Several purchases of 500 to 700 tons are entered, at reaffirmed prices. Labor day caused no interruption to the level of shipments. Notable is the general improvement among jobbing foundries in the past few weeks.

St. Louis—Activities in pig iron throughout this area continue to hold well, both in point of new buying, shipments and the volume being currently melted. August shipments were nearly double those of July, and with the exception of April, the largest so far this year. Producers intimate that an upward revision of prices is likely before the expiration of the final quarter. Consumer stocks are in the main of moderate proportions, attributable to the unusually heavy summer melt and to the policy of a majority of users to purchase only for immediate requirements.

Birmingham, Ala.—While orders for iron are still mostly in small lots, the aggregate is more satisfactory and further strength is noted. Shipments on contracts received some weeks back continue active.

Toronto, Ont.—Merchant pig iron sales are beginning to show improvement. Melters are taking larger tonnages than they were a few weeks ago. Four blast furnaces are in operation and production is running at its new peak for the year, in excess of 50,000 tons per month.

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Cold Finished

Cold Finished Prices, Page 71

Pittsburgh—The new schedule of extras for cold-finished carbon steel

bars, which producers have adopted generally for fourth quarter, has not disturbed equalization bases in other markets. The market has been enlivened by buying from the automotive trade for advance models, which will be in quantity production by October. Cold-drawn alloy bars remain quoted 2.95c, Pittsburgh, Buffalo, Chicago, Massillon, Canton or Bethlehem.

Scrap

Scrap Prices, Page 73

Pittsburgh — Bidding on September railroad lists is a feature of this week with the Baltimore & Ohio's list to close Sept. 9, followed by the Pennsylvania with 7400 tons of No. 1 heavy melting steel, to be bid Sept. 11. The recent prominence of railroad scrap over local dealer accumulations has taken on increased accent, thus accounting for the $1 a ton spread between the two grades. Ordinary dealer heavy melting scrap remains $13 to $13.50 and the railroad grade, $14 to $14.50. Each is strong on the basis of recent purchases. Machine shop turnings are now quoted $9.50 to $10, borings and turnings, $7 to $8, and hydraulic compressed sheets, $13 to $13.50. A marked preference for light bundled skeleton scrap at around $12 to $12.50 as well as for No. 2 steel at the same level is noted on the part of one district mill here.

Cleveland—One important steelmaker in this district has just closed for several thousand tons of heavy melting steel and pressed sheets with local scrap interests, paying the going market of $12.50 for heavy melting. This follows upon the purchase of blast furnace material by another local steelmaker which also brought the market level. Shipments are going to consumers regularly, especially involving blast furnace material and some heavy steel. Advices from the Youngstown district indicate that shipments of scrap on most grades are being held up at this time by two large steelmaking interests.

Chicago — Scrap prices are moderately easier and with heavy melting steel offered to mills at $12.75, this grade is off 25 cents from the previous market. Mill buying is light and the easier price situation largely is a reflection of the desire of sellers for additional business. Shoveling steel and No. 2 railroad wrought also are down 25 cents, but quotations on other grades generally are steady.

Boston — Scrap prices are strong, notably heavy melting steel for export, turnings for Pitsburgh shipment, textile machinery cast and cotton ties. Demand for export and outside domestic shipment is well sustained, although the latter is not heavy. New England steel works are taking less heavy melting steel at $9 and $8, delivered, on the respective grades in view of firmer quotations for export. For delivery dock, up to $9.50 is reported paid for No. 1, but considerable material is being bought at $9.25 with $8.25 still being paid for No. 2. A firmer trend is apparent, however, for heavy melting steel for export while uncleaned engine blocks bring $7, dock. Bids up to $3.70, f.o.b. are made for machine shop turnings.

New York—For No. 1 heavy melting steel for export, $8.75 is more frequently paid at barge, tonnage lots generally bringing that price. No. 2 is unchanged at $7.50, barge. Buying for boat loading continues against contracts, there being little new export business. Shipments of No. 2 to eastern Pennsylvania from northern New Jersey are fairly brisk, consumers paying $10.50 to $11, delivered, and the latter price predominating. Some No. 1 melting steel is moving to Coatesville, Pa., at $12, delivered. Considerable heavy melting steel is also moving by water to the Buffalo district, the shipper moving the material from the yard.

Philadelphia — Strength continues in scrap prices, with several grades higher. No. 2 steel is now quoted at $11 to $11.25, with sales at the outside figure for Pencoyd, Pa. No. 1 steel holds at $12, with brokers paying $12 for material to cover consumer contracts actually booked at that figure. Any new consuming purchase of size should result in an advance, it is believed.

On the sale of its monthly accumulation of new compressed sheets, amounting to approximately 1800 tons, the Edward G. Budd Mfg. Co., Philadelphia, obtained better than $11 at its plant. This material was purchased by the Pencoyd, Pa., consumer. Good prices also were realized by the Budd company on 600 tons of other miscellaneous scrap, including a carload of stainless steel, which went at close to $100 a ton. The last important sales of this stainless steel scrap are reported to have gone at around $80 to $85 a ton.

Buffalo — Several thousand tons of No. 1 heavy melting steel have been purchased by a local consumer at $12, with $1 less offered for No. 2 and substitutes. The buying probably continues but dealers seek a minimum of $12.50 for tonnage, they assert. Specialties have also moved in small lots and prices at the high point of the quarter are being established or maintained in these deals. The offers of other markets are diverting much scrap from this district.

Detroit—Dealers continue to pay prices for scrap at automobile plants which indicate no weakness in the market. Holdups for bundles were issued last week at Youngstown and Steubenville, O., but as yet there has been no effect here. All prices continue unchanged except stove plate, which is up 50 cents to $7 to $7.50. It will be late September or early October before factory offerings of scrap increases materially.

Cincinnati — Quotations on iron

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Smooth running? — Low maintenance? — Long life? — With the Wissco (U. S. Patent 1,952,973) Balanced Spiral Conveyor Belt you get all of these. Wissco Belts are made in a variety of metals and alloys to operate in high temperatures, under adverse chemical and atmospheric conditions and to carry products that would quickly destroy a belt made of ordinary metals. Wissco Belts will satisfy your demands.

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and steel scrap are unchanged, with dealers still buying to increase supplies. A tinge of softness has crept into the market, however, as mills continue to exert pressure on prices. Buying of melters is desultory.

St. Louis — Owing to the easier tone of the market at Chicago the keen edge is off of iron and steel scrap in this area. However, prices are strong, and there were a number of advances, mainly adjustments with quotations in other centers.

Seattle — Domestic turnover is small as local mills are buying only occasionally and foundry consumption is small. Exporting houses are marking time. However, with Japan overstocked and China in a financial plight, the prospects are not promising for the immediate future. The market continues weak.

Birmingham, Ala.—A large scrap consumer has purchased 600 tons of heavy melting, 300 tons of No. 1 cast and 100 tons of mixed. A few other sales have been reported and numerous inquiries have been received. No export business has been closed yet as prices offered cannot be met. Quotations are practically unchanged but firm.

Toronto, Ont.—Improvement in the iron and steel industry has not yet had any material effect on scrap trading. While shipments of heavy melting steel are being made to mills in the Hamilton district, there is little demand for turnings and other steel grades. Iron scrap has a steady small call for special grades.

Hydro Stamping & Mfg. Co. has moved its plant from 6543 Sylvester avenue to 725 Piquette avenue, Detroit.

Warehouse

Warehouse Prices, Page 74

Pittsburgh—Revised quantity differentials on hot-rolled products are expected to be announced about Oct. 1. These will be in line with changes made by the mills recently. A revision in cold-drawn quantity extras is expected sometime in the near future, but possibly not as early as Oct. 1. Volume of shipments continues at an encouragingly high level.

Chicago — The holiday curtailed warehouse sales the past week, but recovery is in early prospect. August business was slightly heavier than that of July and the fall outlook is favorable. Prices on steel bars and nails have not been affected by recent mill revisions.

New York — Improved buying of boiler tubes has started with some distributors. Despite the holiday, jobber sales held up well, volume being well spread. Warehouses expect to apply cold bar size extras about Oct. 1. Weak spots in the price structure, notably galvanized sheets and bolts and nuts, are evident, with foreign steel also a factor in some sections.

Philadelphia—Jobbers are looking for increased business this month and report August as being on a parity with July, and in the case of some sellers a little better. While no price changes are reported, there should be some revision in extras on cold finished bars and certain other products to conform with changes being made in mill schedules. It is possible there will be no changes until October.

Cincinnati—Sales of steel from warehouses show the same character as August business. Individual orders remain light. Adjustments in bar prices, to accord with mill changes, will not be made until the fourth quarter, if then. All other prices are steady.

St. Louis—Distribution during August continued at the satisfactory rate which has obtained since early spring. Volume was measurably greater than a month and a year earlier, and prospects for September are exceptionally good. Demand for sheets, bars and wire and wire products has been well sustained. Materials for use in private construction are more active than in any like season in recent years. Prices remain unchanged.

Seattle — August volume is on a level with July, both months showing improvement over last year. Considerable business is on the books for early September delivery. The majority of orders are coming from public works sources, but renewed activity in lumber and logging accounts for a larger buying by private interests. Prices are steady.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

Weakness continues in bolts and nuts, the nominal discount of 70-10-5 off list being generally shaded. Large rivets are steady at 2.90c, Pittsburgh and Cleveland and 3.00c, Chicago. Small rivets are 70-5 off list. Prices for fourth quarter are expected to be announced within a few days.

Specifications show moderate increase from the general manufacturing trade, with railroad buying light and jobbers awaiting clarification of the price situation following recent changes in quantity extras on bars.

Metallurgical Coke

Coke Prices, Page 71

Foundries are keeping up only a small volume of metallurgical coke specifications, although Connellsville, Pa., base prices on beehive grades are fairly firm. Common foundry grades are remaining around $4 a ton at that point and premium grades about $5 a ton. Standard furnace coke contracts have been negotiated recently at as high as $3.60, although some spot sales are being made to meet certain competitive conditions at $3.40 and as low as $3.25. Shen-

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This spring has a long, and useful life of one hundred million or more compressions.

This spring may fail before reaching one hundred thousand compressions.

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Producers of Superior Springs

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Ordinary spring wire, Out-of-date methods, poorly regulated heat treatment, lack of broad experience, produce the ordinary spring, perhaps useful fifty years ago, but worse than useless in the high grade engineered products of today.

ango Furnace Co. has resumed blast in its Sharpsville, Pa., furnace and is using Midland by-product coke.

By-product coke shipments to foundries in the Chicago district are heavier than in August. Prices are steady with indications of higher levels for fourth quarter. Cincinnati coke producers find demand increasing from all users, with prices firm. In the St. Louis area the high rate of consumption is continued, with specifications increased. Producers at Birmingham, Ala., continue their activity on sustained demand.

Iron Ore

Iron Ore Prices, Page 73

Cleveland — Shipment of iron ore from upper lake ports in August totaled 4,780,570 tons, an increase of 618,884 tons or 14.87 per cent over August, 1934, according to the Lake Superior Iron Ore association, whose report for various ports follows:

Port and Dock	August, 1935
Escanaba, C. & N. W.	185,794
Escanaba, C. M. & St. P. & P.	102,496
Marquette, D. S. S. & A.	40,209
Marquette, L. S. & I.	439,505
Ashland, C. & N. W.	362,609
Ashland, Soo Line	105,236
Superior, Great Nor.	1,635,971
Superior, Soo Line	67,281
Superior, Nor. Pac.	69,224
Duluth, D. M. & N.	1,212,694
Two Harbors, D. M. & N.	559,551
Total	4,780,570
1935 increase (14.87%)	618,884

For the season to Sept. 1 the movement of iron ore has been 17,386,599 tons, which is a gain of 1,701,388 tons or 10.85 per cent over the same period of 1934. Statistics for loading for the season to Sept. 1 are:

Port and Dock	To Sept. 1, 1935
Escanaba, C. & N. W.	678,024
Escanaba, C. M. St. P. & P.	238,500
Marquette, D. S. S. & A.	388,680
Marquette, L. S. & I.	1,240,955
Ashland, C. & N. W.	1,490,153
Ashland, Soo Line	477,977
Superior, Great Nor.	5,769,241
Superior, Soo Line	217,854
Superior, Nor. Pac.	185,497
Duluth, D. M. & N.	4,581,488
Two Harbors, D. M. & N.	2,117,930
Total	17,386,599
1935 increase (10.85%)	1,701,388

Ferroalloys

Ferroalloy Prices, Page 72

New York—Ferromanganese sellers are expected to open books this week for fourth quarter. While the trade generally expects reaffirmation of the present $85, duty paid price, this is not definitely assured. Specifications started off the new month slowly, but fall business is expected to be brisk. Domestic spiegeleisen, 19 to 21 per cent, is $26, Palmerton, Pa., on quantities up to 50 tons and $24 on lots of 50 tons and over. It is believed probable that should ferromanganese sellers open their books for fourth quarter this week, spiegeleisen sellers will do likewise.

Steel in Europe

Foreign Steel Prices, Page 74

London—(*By Cable*)—With most steel and iron producers in Great Britain working against substantial bookings, the outlook is most encouraging. Output of pig iron shows every sign of increasing as autumn demand develops. Shipments from Middlesbrough in August were the heaviest since April. Steel producers are selling heavy tonnages of semifinished steel.

Improved export trade is enjoyed by producers on the Continent, the general upturn being attributed to the new cartel agreement with Great Britain, and steelmakers there are confident of continued gradual expansion.

Coke By-Products

Coke By-Product Prices, Page 74

New York—Following somewhat brisk sales for immediate shipment last month, sulphate of ammonia is less active. Some buying for spring is noted, but it is light, with prices unchanged. Naphthalene is sluggish, in small lots. Phenol demand is steady and unchanged. Distillates are in good demand with toluol active. Prices are steady and unchanged.

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York—Underlying price firmness of major domestic nonferrous metals, despite lagging demand, featured the markets last week. Recessions early in the week in Straits tin prices were partially offset by recoveries in the latter half of the period.

Copper — Outlook in the copper market is still for firm prices indefinitely ahead on the basis of 8.50c, Connecticut, for electrolytic. Shipments continue to move to fabricating plants at an active rate. Casting copper advanced 10 points to 8.10c, refinery, due to limited supplies available in the market.

Lead—Sellers retained firm price levels on basis of 4.35c, New York, despite a drop in demand from the moderate rate of the previous week to light carlot and larger-lot buying last week. Much potential buying hangs over the market.

Zinc — Price tone was well sustained by sellers' convictions that consumption is holding up well and that no advantage can be gained by pressing metal on an unwilling market until current order backlogs are reduced further. Quotations were unchanged at 4.60c, East St. Louis.

Tin—Straits tin prices regained a portion of their lost territory on

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NATIONAL FORGE AND ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNA.

Thursday when the London market moved upward after earlier weakness. Domestic sales were light. Straits spot closed around 48.70c.

Antimony — Prices held without change on light small-lot buying.

Mirrors of Motordom

(*Concluded from Page 24*)

the initial stage may be an air-conditioning unit mounted under the instrument board, somewhat similar to a heater. In fact, some smart accessory manufacturer may devise a dual unit. If the course of many previous comforts is followed, some automobile manufacturer will break the trail, then a host of accessory units will be sold, followed by the incorporation of air-conditioning as initial equipment.

The alternative to the unit under the instrument board or dash appears to be ducts through the top, with outlets downward upon the heads of passengers. Any system apparently will have to reckon with windows that will be opened at times, as any sealing of passenger car windows would seem to be out of the question.

An important use of steel may be developing in this trend toward air-conditioning, in the form of ducts, registers, pipe, and the tanks and circulating pumps and motors.

Develop "Fast" Tire

Out of Akron come rumors of a radically-new tire, considerably broader than even the present balloon type and able to round a corner at 50 miles an hour without divorcing the rim. In one wheel design, spokes are eliminated and all that is visible is the tire and the hub cap in the center.

Relations between automobile manufacturers and dealers as a whole, which have been a little rocky this year owing to the "freezing" of many dealers' capital and profits in used cars, have not been improved recently by the protest of the National Automobile Dealers association against manufacturers quoting f.o.b. prices in their advertisements.

Dealers want delivered prices advertised, claiming that the spread between the f.o.b. factory price and the delivered price gives prospective buyers a false impression of dealer margins. Dealers also contend there are too many "plus" items, and that such equipment as bumpers, spare tires, etc., which are essential and which are usually factory mounted should be lumped in with the final delivered price.

At Washington last week the association urged the federal trade commission to perpetuate the principles of used car allowance control which were set up in the motor vehicle retailing code. A representative of the association scored factories for packing in dealers, appointment of under-capitalized dealers and for not protecting dealers in cleanup sales at the end of a model run.

While it is interesting to automobile manufacturers to watch Father Coughlin battle the A. F. of L. over the organization of automobile workers, nevertheless the industry is loath to see its labor kept churned up. The A. F. of L., through its United Automobile Workers, has the edge on other labor groups, but the leadership which the A. F. of L. is forcing upon its automotive branch and the blasts from Father Coughlin are not doing it any good.

The same legal leadership is attacking both the automobile and the iron and steel industries, and may afford the first test case of the new Wagner act. Charlton Ogburn, counsel for the A. F. of L., who figured in many Amalgamated Association of Iron, Steel and Tin Workers' cases, has brought complaint against Chevrolet, Fisher Body, and Bendix over alleged refusal to accept the union for bargaining purposes, and has also acted against the Wheeling Steel Corp.'s Portsmouth, O., plant.

White Streamlines a Truck

White Motor Co. last week introduced in the truck field a unit equally as striking in its way as the new Buick is in the passenger classification. Designated White 704, R. F. Black, president, predicts that it will double production at the White plant in Cleveland during the remainder of this year and will develop sales of 15,000 to 20,000 units in 1936.

Streamlining features include a blending color and molding design between the radiator shell, cowl, hood and rear; fully streamlined headlights, and creased center lines in fenders.

This new truck is powered by a 6-cylinder 270 cubic-inch engine. The cab is claimed to be the first automatic air-conditioned one ever placed on trucks. Brakes are of the hydraulic, four-wheel booster type. The complete chassis is built throughout of heat treated steel.

Edward G. Budd Mfg. Co., Philadelphia, has booked from the Amtorg Trading Corp., acting for the Russian automobile monopoly, an order for dies and stampings that will keep its tool and machine shops busy for six months.

The order covers dies and initial stampings for a complete body and chassis frame for a long wheelbase, four-door sedan, including fenders, hood, radiator shell, running boards and trunk rack. It also includes dies and initial stampings of disc wheels to be produced by the Budd Wheel Co. in its Detroit plant.

The car will be manufactured by the soviets in the Stalin works in Moscow. Although the Russians have been building Ford cars at Nizhnii Novgorod for several years, this will be their first venture in the production of a large car and also the first of the closed body type.

Activities of Steel Users and Makers

(*Concluded from Page 28*)

for the Chicago, Burlington & Quincy railroad.

♦ ♦ ♦

Ashton Valve Co., Boston, has appointed the Ashmead Banks Co., Rockefeller building, Cleveland, distributor for northern Ohio for its line of safety and relief valves, pressure gages and similar products.

♦ ♦ ♦

Danly Machine Specialties Inc., 2110 South Fifty-second avenue, Chicago, manufacturer of all types of standard and special die sets and die makers supplies, and sole representative of the mechanical industries of Danly-Smith welding, has recently opened an assembly plant and branch office at 3913 North Broad street, Philadelphia. S. R. Anstey is in charge.

♦ ♦ ♦

Austin-Hastings Co. Inc., 226 Binney street, Cambridge Mass., steel warehouse, is building an office structure and adding 2400 feet of floor space to its warehouse and has leased 7500 feet of floor space by taking over a building owned by the Standard Oil Co.

♦ ♦ ♦

African Metals Corp., exclusive buying and selling representative for a number of European companies trading in pig iron, nonferrous metals, cement and industrial and agricultural chemicals, has moved its offices from the twenty-second to the eighth floor of the Cunard building, 25 Broadway, New York. Among the principal companies represented are Union Nimiere du Haut Katanga, Societe Generale des Ninerais, Societe Generale Metallurgique de Hoboken, Union Chemique Belge, Societe des Produits Chimiques de Tessenderloa, Compagnie des Metaux d'Overpelt-Lommel et de Corphalie, S. A., Sepulchre Freres, S. A. John Cockerill, Comptoir Belge du Plomb Ouvre, and Societe des Produits Chimiques d'Auvelais.

Other companies are Ougree Steel Trading Co. Ltd. and N. V. Miden-Nederlandsche Handels-Maatschappij. Except for these latter two companies, which have headquarters in London, England, and Amsterdam, Holland, respectively, all have their principal offices in Belgium.

Convention Calendar

Sept. 9 — Associated Machine Tool Dealers. Annual meeting at Hotel Cleveland, Cleveland. Harry Barney, Barney Machinery Co., Koppers building, Pittsburgh, is secretary.

Sept. 11-21—National Machine Tool Congress (Third). In Cleveland, under auspices of the National Machine Tool Builders' association; Machine Shop Practice division, American Society of Mechanical Engineers; and Production Activity division, Society of Automotive Engineers. Herman H. Lind, 1220 Guarantee-Title building, Cleveland, is general manager, National Machine Tool Builders' association.

Sept. 11-21—National Machine Tool Exposition (Third). In Public Auditorium, Cleveland, under auspices of the National Machine Tool Builders' association. Roberts Everett Associates, 232 Madison avenue, New York, are managers.

Sept. 14-16—Special Tool, Die and Machine Shop institute. Annual convention at Hotel Statler, Cleveland. George J. Huebner, 1225 Guarantee Title building, Cleveland, is secretary.

Sept. 16-18—Iron and Steel institute (British). Autumn meeting at Manchester College of Technology, Manchester, England. K. Headlam-Morley, 28, Victoria street, London, S.W.1, is secretary.

Sept. 18-20—National Industrial Advertisers association. Annual convention in William Penn hotel, Pittsburgh. Allan E. Beach, Littleford Bros., 453 East Pearl street, Cincinnati, is secretary.

Sept. 20-21 — American Ceramic society. Meeting of Refractories division at Pennsylvania State college, State College, Pa. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

Sept. 23-27—American Mining Congress. Annual convention and exposition at Palmer House, Chicago. Julian D. Conover, 439 Munsey building, Washington, is secretary.

Sept. 24-26—Association of Iron and Steel Electrical Engineers. Annual convention and exposition at William Penn hotel, Pittsburgh. T. B. Little, Empire building, Pittsburgh, is acting managing director.

Sept. 30-Oct. 4—American Institute of Mining and Metallurgical Engineers. Fall meetings of Iron and Steel and Institute of Metals divisions in Chicago. John T. Breunich, 29 West Thirty-ninth street, New York, is assistant secretary.

Sept. 30-Oct. 4.—American Society for Metals. Seventeenth annual National Metal congress at Palmer House, Chicago. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Sept. 30-Oct. 4—American Welding society. Fall meeting in Chicago. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Sept. 30-Oct. 4—National Metal exposition. Seventeenth annual, in International Amphitheater, Chicago. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is general manager.

Sept. 30-Oct. 4—Wire association. Annual meeting at Congress hotel, Chicago. Richard E. Brown, 17 East Forty-second street, New York, is secretary.

Oct. 14-15—American Gear Manufacturers' association. Semiannual meeting at General Brock hotel, Niagara Falls, N. Y. J. C. McQuiston, Penn Lincoln hotel, Wilkinsburg, Pa., is secretary-manager.

Oct. 16-18—American Institute of Steel Construction. Thirteenth annual convention to be held at Greenbrier hotel, White Sulphur Springs, W. Va. V. G. Iden, 200 Madison avenue, New York, is acting secretary.

Nov. 12-15—International Acetylene association. Thirty-sixth annual convention at Hotel Cleveland, Cleveland. H. F. Reinhard, 30 East Forty-second street, New York, is secretary.

Nov. 18-20—National Foreign Trade council. Twenty-second convention in Houston, Tex. Lindsay Crawford, 26 Beaver street, New York, is secretary.

Iron Ore Found In East Texas

ABOUT 200,000,000 tons of iron ore in eastern Texas could be mined commercially, according to a report just issued by the University of Texas' bureau of economic geology, Austin, Tex., in conjunction with the United States geological survey.

The estimate does not include deposits less than 18 inches thick, ore with overburden more than three times its own thickness, or ore that contains less than 43 per cent iron.

The largest deposits are in Cass, Cherokee, Marion, Morris and Upshur counties, within a few miles from a railroad, according to the report.

The northern area centers around Marshall and Jefferson, the southern around Cherokee county.

"Most of the East Texas ores are classed as limonite, or hydrated iron oxide, usually known as brown ores," continues the report. "Iron carbonates, or siderite, is found also in considerable quantities, especially in the northern part.

Overburden Is Light

"In many places 2 or 3 feet of ore occurs within 5 feet of the surface, and the ratio of waste material to ore is seldom more than five to one. Washed ore for shipment to blast furnace usually contains 48 to 55 per cent metallic iron, 3 to 12 per cent silica, 3 to 8 per cent alumina, and less than 0.1 per cent phosphorus. Some of the southern ores are lower grade than northern ores, and when ready for the furnace usually contain 42 to 50 per cent iron, 9 to 22 per cent silica, 6 to 12 per cent alumina, and 0.2 per cent phosphorus.

"Mining and concentration costs should not be excessive, but gathering ores from a large number of scattered deposits presents some difficulties. However, a number of individual deposits contain from 1,000,000 to 14,000,000 tons of good ore.

"During the period 1882-1908, inclusive, which covers most of the iron ore operations in East Texas, a total of 427,000 tons of iron ore was removed, according to available records. Thus mining operations to date, including the ores taken for the former state penitentiary blast furnace project at Rusk, amount to only one-fourth of 1 per cent of the present conservative estimate of commercial ore."

SOVIET MAKES QUALITY STEEL

Production of what the bulletin of economic information, of Moscow, terms quality steel in the soviet union reached 80,500 metric tons in 1934, compared with 34,650 tons in 1933. Last year's production is classified as 49,000 tons of ball bearing steel, 30,000 tons of motor spring, and 1500 tons of heat resisting.

Equipment

Pittsburgh—Tennessee Valley authority, Knoxville, Tenn., will open bids Sept. 11 for a revolving gantry crane for the Pickwick Landing dam. Dravo-Doyle Co., Pittsburgh, recently received an order from a prominent steel concern for a number of unit heaters to be used for heating a complete continuous mill building, heating a pickling room, and a mold loft for a boat yard.

Chicago — While machine tool sales have tended to lag recently, such equipment continues more active than most other branches of the machinery industry. Machine tool production is at 110 per cent of normal, while farm machinery makers are around 65 per cent of normal output, but the average for the entire machinery industry is not expected to show more than 40 or, as a maximum, 50 per cent of normal when figures are available in a few weeks for the first six months of the year, according to a recent statement by John W. O'Leary, president of the Machinery and Allied Products institute. The tendency of some large automotive concerns to decentralize production is aiding machine tool demand, though few purchases have been made in this area lately.

Seattle—Machinery dealers report an improved turnover with reopening of lumber mills following a 3-month strike. Logging operations will be generally resumed next month with the beginning of the rainy season and operators will be in the market for replacements and new items. Shipments to Alaska continue in large volume for mining and dredging operations.

New York—Machinery and equipment buying has declined, due largely to the decision of buyers to await

the Cleveland show before closing orders. Most dealers are agreed the slump of the last two weeks can be traced to this reason, pointing to specific instances where buying has been deferred. Heavy inquiry for the Philadelphia aircraft factory, involving nearly 40 machines with turret lathes largely included, has featured current activity.

Boston—Substantial business expected to follow the machine tool show in Cleveland this week will add materially to the already heavy backlogs held by numerous New England machinery builders. An increasing volume of outdoor machinery is being purchased for the Eastport, Me., tidal power project. Springfield, Mass., armory has closed on a considerable volume of small tools and grinding wheels.

Construction and Enterprise

Michigan

MT. MORRIS, MICH.—Francis Engineering Co., Saginaw, Mich., is completing plans for a $40,000 water system to be erected for the village of Mt. Morris.

DETROIT—W. E. Wood Co., 4649 Humboldt street, has been awarded contract for an addition to the plant of the National Broach & Machine Co., 11457 Shoemaker street.

DETROIT — Peninsular Steel Co., 1468 Lakeside avenue, Cleveland, will build an addition to its warehouse at 1030 McDougall avenue, Detroit, 60 x 120 feet, to cost $25,000. Contract has been let to W. C. Kaufmann Co., 10610 Shoemaker street, Detroit. Other warehouses are at Cleveland, Dayton and Toledo, O.

Illinois

BENTON, ILL.—An explosion destroyed the engine room of the Valier Coal Co. mine here. Boilers, hoisting machinery, and other equipment were severely damaged. The company plans to replace the machinery and equipment at once.

CHICAGO—Ace Plating Co., 33 North LaSalle street, has been incorporated to engage in business of plating and otherwise coating metals, by George A. Kappus, C. R. Golder and M. A. Teal. Correspondent; Hoffmand & Golder, American National Bank building.

Ohio

ELYRIA, O.—Western Automatic Machine Screw Co. has awarded contract to Sam W. Emerson Co., 1836 Euclid avenue, Cleveland, for construction of a manufacturing plant, 190 x 210 feet. Estimated cost $75,000.

CINCINNATI—Brighton Screw & Mfg. Co., 1456 Harrison avenue, sustained damages by fire which originated in the engine room.

Indiana

EVANSVILLE, IND.—Southern Indiana Gas & Electric Co. plans extensions and improvements in electric generating plant, with installation of additional equipment for increased output. Cost $851,900.

SOUTH BEND, IND. — Studebaker Corp. officials announced recently that a Los Angeles factory would be converted into an assembly plant to serve the west coast. Assembly is expected to begin about Nov. 1.

New York

NEW YORK—Miller's Welding Service Inc. has been organized to engage in welding. Papers were filed by Long, Lamberton & Winkler, 70 Pine street.

NEW YORK—Horni Signal Mfg. Co., 515 Greenwich street, plans plant improvements and extensions. Work will be financed through stock issue. Cost will exceed $28,000.

NEW YORK—Handy & Harman, 82 Fulton street, manufacturers and refiners of metals, are building a new plant in Toronto, Ont. It will be operated by Handy & Harman of Canada Ltd., a subsidiary company, and will be located at 141 John street. The new plant will be equipped to carry on all operations now performed at the main plant in Bridgeport, Conn. ....

ROCHESTER, N. Y.—Rochester Distilling Co., 8 Exchange street, has plans for altering its present distillery and adding a new refinery building. Complete equipment will be purchased.

TARRYTOWN, N. Y. — General Motors Corp., General Motors building, Detroit, has preliminary work under way for expansion of its Fisher Body and Chevrolet Motor Co. plants here. Two new factories will be added to the Fisher Body group and one to Chevrolet. Estimated cost of buildings and equipment is $2,000,000.

Connecticut

FAIRFIELD, CONN.—McKesson & Robbins Inc. will soon let contract for a 2-story, 100 x 200-foot, steel factory addition, costing over $28,500.

GREENWICH, CONN. — Electrolux Inc., 500 Fifth avenue, New York, plans installation of motors and controls, conveyors, etc., in new addition to vacuum cleaner manufacturing plant here. Cost more than $100,000.

NEW BRITAIN, CONN.—Landers, Frary & Clark Inc. plans installation of motors and controls, conveyors and other electrical equipment in new six-story addition for production of electric refrigerator units. Cost close to $125,000, including equipment. W. F. Brooks, Lewis street, Hartford, Conn., is architect.

New Jersey

POINT PLEASANT, N. J. — Borough council will make application for federal funds for constructing water plant. Estimated cost $41,000. J. T. Humphries, engineer.

Pennsylvania

SPRINGDALE, PA.—Hollow Extrusion Specialty Co. has been granted a state charter to manufacture metal tubing, by C. D. Skinner, Leo Bradley and J. C. Myers.

Alabama

OPELIKA, ALA.—Lee County Power association plans rural electrification program throughout county. Cost close to $65,000, with power substation and service facilities. Financing is being arranged through rural electrification administration.

SELMA, ALA.—McFerson & Foster Box Factory plans to increase capacity by building an addition to its plant on Sylvan street. Machinery will be installed. L. Schorttlin is manager.

Maryland

CRISFIELD, MD.—City has approval of grant of $49,909 of PWA funds to construct sewerage system. Grant is 45 per cent of estimated total cost; city plans to borrow $61,000.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids Sept. 20, schedule 5878, for motors, hoists, control appliances and spare parts, delivered Portsmouth, N. H.

WASHINGTON—Corps of engineers, war department, has been allotted $5,000,000 by the President for preliminary construction work on a sea level ship canal across Florida. Project will include housing, shops, storehouses and minor structures costing $500,000.

WASHINGTON—Government printing office plans installation of motors and controls, regulators, electric hoists and other material handling equipment in new eight-story printing plant addition at North Capitol and Eighth streets. An appropriation of $5,885,000 has been approved for project, including land.

Georgia

SAVANNAH, GA.—A. S. Goebel, city engineer, presented to WPA plans for $175,000 improvements to municipal airport. Plans call for erection of steel and glass hangar, 120 x 120 feet, and two 30 x 30-foot lean-tos at side for use as machine shop.

THUNDERBOLT, GA.—Town plans to apply to PWA for funds to construct water system at expenditure of about $35,000. Project will include 100,000-gallon steel tank mounted on 100-foot steel tower.

Louisiana

JENNINGS, LA.—Lake Tool Co., M. L. Yount president, with headquarters at Longview, Tex., is planning to erect five buildings here to be equipped for boiler construction and machine work.

Mississippi

COLUMBIA, MISS.—George Westerfield will rebuild saw mill and planer recently destroyed, with loss of buildings, furnace and boiler room.

MERIDIAN, MISS.—City, Clint Vinson mayor, will apply for loan and grant for generating plant and distribution system.

North Carolina

SALISBURY, N. C.—Zenith Chemical Co. is planning to rebuild its plant recently damaged by fire.

SOUTHPORT, N. C.—City applied to

(*Please turn to Page* 92)

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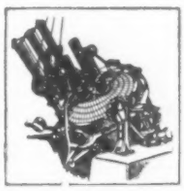

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(*Concluded from Page 90*)

PWA for funds to construct an electric light plant, to supplement one already in operation.

WILMINGTON, N. C.—Tide Water Power Co. has plans for a rural electrification program in group of about 16 counties in southeastern part of state. Project reported to cost over $500,000. Financing is being arranged through rural electrification administration.

South Carolina

AIKEN, S. C.—Aiken county has applied to PWA for loan and grant of $1,700,630 for erection of power plant on south Edisto river. A. E. Yaun, chairman of county board of commissioners.

ANDERSON, S. C.—City voted $110,000 sewage disposal plant bonds at an election Aug. 13.

WALTERBORO, S. C.—Town has applied to state PWA at Columbia, for $67,360 to improve water and sewerage system. Ryan Engineering Co., engineer, Columbia, S. C.

Tennessee

MEMPHIS, TENN.—Department of commerce, bureau of aeronautics, has approved specification for $225,000 improvements at municipal airport, including installation of additional equipment. Paul Morris is engineer.

NASHVILLE, TENN.—Will T. Cheek chairman, city's airport committee, has submitted plans to WPA officials for construction of administration buildings and hangars at municipal airport, will probably issue $100,000 airport bonds.

PULASKI, TENN.—City has been authorized by Tennessee general assembly to issue $37,500 bonds for erection of a factory building.

West Virginia

MORGANTOWN, W. VA.—City applied to state PWA, M. L. O'Neale director, Charleston, for $95,000 loan and grant to build incinerator.

THOMAS, W. VA.—City has PWA approval for construction of waterworks to cost $60,000.

Virginia

HIGHLAND SPRINGS, VA.—Board of supervisors, Henrico county court house, Twenty-second and Main streets, Richmond, Va., will receive bids Sept. 16 to furnish and erect a 200,000-gallon capacity steel water tank on 100-foot steel tower and appurtenances, erect two pump houses and furnish and install two deep well turbine pumps of 150-gallon capacity each. Plans may be obtained at office of R. Stuart Royer, consulting engineer, 207 Builders Exchange building, Richmond.

MADISON, VA.—City voted $30,000 waterworks bonds.

RICHMOND, VA.—Virginia Airship Co., Garret W. Peck president, plans to construct a terminal and manufacturing plant at Byrd airport, for which $175,000 WPA funds have been approved.

Missouri

ST. LOUIS—Mississippi Valley Equipment Co., 511 Locust street, wants prices and data on following: two 80-horsepower, 3-phase, 60-cycle, 240-volt diesel generator sets; a 300-horsepower, 3-phase, 60-cycle, 4000-volt synchronous motor, and a 150-kilowatt, 3-phase, 60-cycle generator uniflow engine.

Arkansas

EL DORADO, ARK.—City, George R. Crosley mayor, has applied for loan and grant to construct light plant.

LITTLE ROCK, ARK.—Plans for an air-conditioned municipal auditorium for Little Rock have been completed by Eugene John Stern & Wittenberg & Delony, architects, and have been approved by the Little Rock civic projects authority preparatory to filing a PWA application, to cost $1,000,000.

MARMADUKE, ARK.—City has PWA grant of $20,700 and loan of $25,300 to build waterworks system.

Texas

BROWNSVILLE, TEX.—City, H. Van Horn city secretary, receives bids Sept. 12 for boiler room rehabilitation at light and power plant.

CUERO, TEX.—City applied for PWA loan and grant of $225,000 for construction of electric light and power plant and distribution system. Garrett Engineering Co., Houston, Tex., is preparing plans and estimates. Mayor J. T. Newman will probably submit details to city council by Sept. 10.

Minnesota

MINNEAPOLIS—Winona Box Mfg. Co., Charles Shapero president, is having plans prepared for remodeling a large building at Sixteenth street and East Hennepin avenue into a box manufacturing plant, and includes installation of considerable new machinery and equipment.

MOUNTAIN IRON, MINN.—Village plans improvements to municipal light and power plant, including installation of a new 150-kilowatt diesel unit, turbine pump and other equipment. Charles Foster, Sellwood building, Duluth, Minn., is engineer.

ST. PAUL—Seegar Refrigerator Co. has awarded contract for construction of a 2-story factory addition, 40 x 225 feet, to be used for the manufacture of metal refrigerator cabinets. Cost estimated at $50,000.

Kansas

LA CYGNE, KANS.—City has applied to PWA for grant and loan to finance construction of a sewage disposal plant to cost $40,000.

PHILLIPSBURG, KANS.—City is completing plans for electric light and power plant, using diesel engine-generator units and electrical distributing system. Fund of $120,000 has been arranged through federal aid. Paulette & Wilson, Farmers Union building, Salina, Kans., are consulting engineers.

STRONG CITY, KANS.—City officials contemplate applying for PWA funds to finance construction and equipping of a municipal light and power plant estimated to cost $55,000.

North Dakota

BISMARCK, N. DAK.—North Dakota Brewing Co., Paul Wachter president, plans construction soon of a new and modern brewery which will have a capacity of 30,000 barrels a year. The company was recently incorporated with capital stock of $225,000.

DICKINSON, N. DAK.—Dickinson Clay Products Co., Sam Zook secretary-treasurer, plans large rebuilding and expansion program to plant, including several new beehive kilns and installation of new machinery and equipment for manufacture of pottery.

DICKINSON, N. DAK. — Lehigh Briquetting Co., K. A. Loven manager, plans improvements and additional machinery and equipment in lignite briquetting manufacturing plant, to cost about $300,000, including one or two new carbonizing units, railway spur. Work will be started this fall.

South Dakota

ARMOUR, S. DAK.—Northwestern Public Service Co., Huron, S. Dak., is arranging for 20-year electric light and power franchise here and plans new power plant for local service. Cost about $100,000.

Nebraska

LINCOLN, NEBR.—O. R. Shatto, secretary of the state board of control, will take bids Sept. 12 for construction of waterworks system at state hospital and reformatory for men, including a 100,000-gallon elevated steel water tank, two pump houses, pumping units and about two miles of cast iron water mains.

TECUMSEH, NEBR.—Eastern Nebraska public power district, care of Dr. A. P. Fitzsimmons president, plans construction of about 10,000 miles of transmission and distributing lines in rural territory, with power substations, switching and service facilities. Proposed to arrange fund of $2,500,000 through rural electrification administration.

Colorado

CLIMAX, COLO.—Climax Molybdenum Co. is planning to build an addition to take care of increased production. Cost estimated at $300,000.

Wyoming

CASPER, WYO.—Reclamation officials will open bids Sept. 17 for erection of concrete and steel frame warehouse, corrugated sheet metal, 33 x 140 feet, for the Seminole dam, and on Sept. 21 for concrete garage and shop buildings for the same project.

Arizona

YUMA, ARIZ.—Bureau of reclamation, Denver, has plans under way for proposed improvements in Yuma-Gila irrigation project. A fund of $4,500,000 will be arranged for construction of transmission and distributing lines, including installation of four large electric-operated pumping stations.

Pacific Coast

SEATTLE—City council will receive bids Sept. 23 for a municipal garage and repair shops.

SPOKANE—West Coast Construction Co., Seattle, has the contract to build a $50,000 terminal, 87 x 126 feet, for the Washington Motor Coach Corp., to include repair shops and gas tanks.

Dominion of Canada

TORONTO, ONT.—Ontario Hydro-Electric commission has plans for new addition to hydroelectric generating plant in Red lake district. Extensions will be made in transmission lines. Entire development is reported to cost about $300,000.